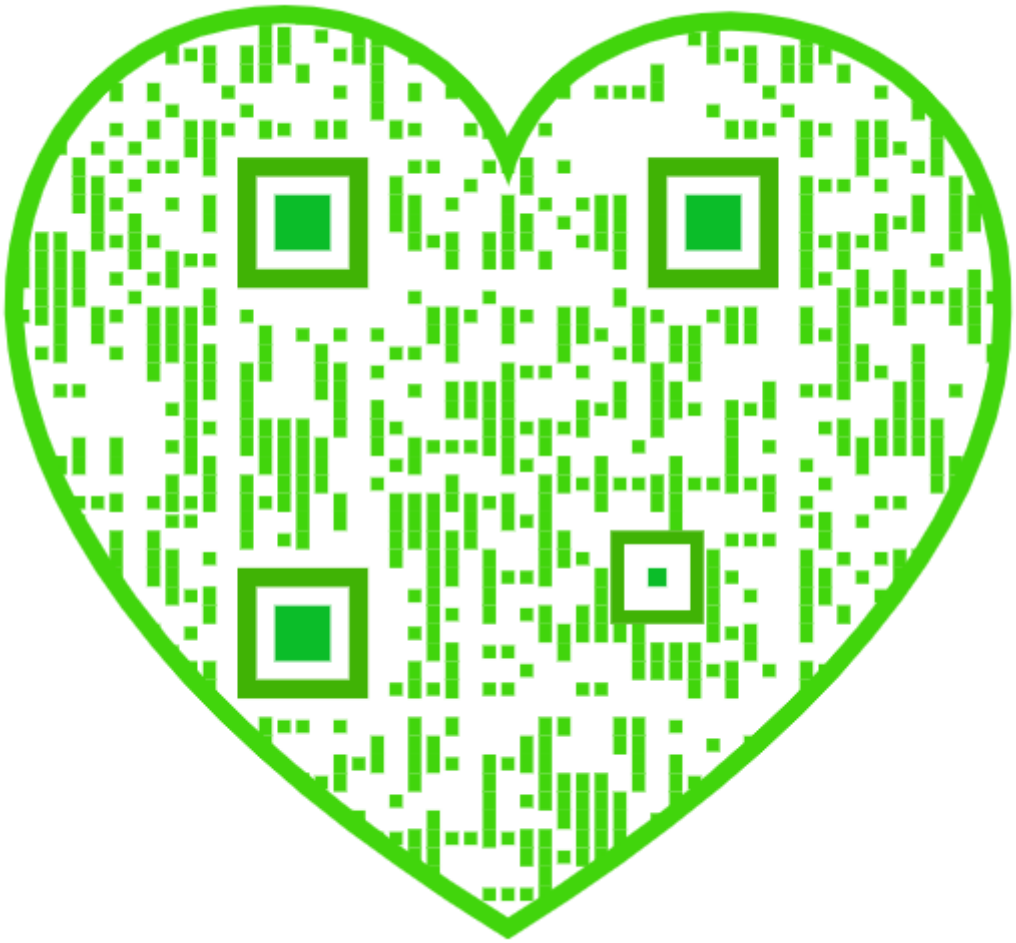

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BIRDS OF NORTH AMERICA

**1. Mocking bird.** 2. Humming bird. 3. Catbird. 4. House wren. 5. Carolina cuckoo. **6. Cedar bird.** **7. Baltimore oriole.** 8. Chicken hawk (male). 9. Blue yellow-backed warbler. 10. Great-horned owl. **11. Brown thrush.** 12. Lady Gould finch. 13. Cardinal (male). 14. Wild turkey. 15. Kingfisher. **16. Peal's Egret heron.** 17. Red-headed woodpecker.

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# KEY TO PRONUNCIATION

Three methods are used to indicate the pronunciation of the words forming the headings of the separate articles:

(1) By dividing the word into syllables, and indicating the syllable or syllables to be accented. This method alone is followed where the pronunciation is entirely obvious. Where accent marks are omitted, the omission indicates that all syllables are given substantially the same value.

(2) Where the pronunciation differs from the spelling, the word is re-spelled phonetically, in addition to the accentuation.

(3) Where the sound values of the vowels are not sufficiently indicated merely by an attempt at phonetic spelling, the following system of diacritical marks is additionally employed to approximate the proper sounds as closely as may be done:

ā, as in fāte, or in bāre.
ä, as in ärms, Fr. âme, Ger. Bahn=ā of Indian names.
ă, the same sound short or medium, as in Fr. bal, Ger. Mann.
a, as in fat.
â, as in fall.
ȧ, obscure, as in rural, similar to u in but, e in her: common in Indian names.
ē, as in me=ī in machine.
e, as in met.
ė, as in her.
ī, as in pine, or as ei in Ger. Mein.
i, as in pin, also used for the short sound corresponding to ē, as in French and Italian words.
oe, a long sound as in Fr. jeûne, = Ger. long ö, as in Söhne, Göthe (Goethe).
eu, corresponding sound short or medium, as in Fr. peu=Ger. ö short.
ō, as in note, moan.
o, as in not, frog—that is, short or medium.
ŏ, as in move, two.
ū, as in tube.
u, as in tub: similar to ē and also to a.
u, as in bull.
ü, as in Sc abune=Fr. ū as in dû, Ger. ü long as in grün, Bühne.
ŭ, the corresponding short or medium sound, as in Fr. but, Ger. Müller.
oi, as in oil.
ou, as in pound; or as au in Ger. Haus.

The consonants, b, d, f, h, j, k, l, m, n, ng, p, sh, t, v, and z, when printed in Roman type, are always given their common English values in the transliteration of foreign words. The letter c is indicated by s or k, as the case may be. For the remaining consonant sounds the following symbols are employed:

ch is always as in rich.
ð, nearly as *th* in this = Sp. d in Madrid, etc.
g is always hard, as in go.
ḥ represents the guttural in Scotch loch, Ger. nach, also other similar gutturals.
n, Fr. nasal n as in bon.
r represents both English r, and r in foreign words, in which it is generally much more strongly trilled.
s, always as in so.
th, as *th* in thin.
*th*, as *th* in this.
w always consonantal, as in we.
x = ks, which are used instead.
y always consonantal, as in yea (Fr. *ligne* would be re-written lāny).
zh, as z in pleasure = Fr. j.

# WINSTON'S CUMULATIVE ENCYCLOPEDIA

## VOLUME II

**Bennett,** WILLIAM STERNDALE, an English composer, born in 1816 at Sheffield, where his father was organist; became pupil of the Royal Academy in 1826, and studied in Leipzig from 1836 to 1838. He is best known by his overtures, the *Naiads* and *Parisina;* his cantatas, the *May Queen* and *Women of Samaria;* and his little musical sketches, *Lake, Millstream* and *Fountain.* He died in 1875.

**Ben-Nevis** (nev'is), the most lofty mountain in Britain, in Inverness-shire, Scotland, south of the river and Glen of Spean. It rises to the height of 4406 feet, and in clear weather yields an extensive prospect. An observatory was established on its summit in May, 1881, by the Scottish Meteorological Society.

**Bennigsen** (ben'ig-sen), or BENNINGSEN, LEVIN AUGUSTUS, COUNT VON, Russian commander-in-chief, born at Brunswick in 1745. After some years in the Hanoverian service he entered that of Russia, 1773, distinguished himself in Turkey and Poland, took part in the conspiracy against Paul I, and was made general by Alexander I. In the war with France, 1805–13, he played a most distinguished part, especially at the battles of Pultusk, Eylau, Borodino, Tarutino and Leipzig. He retired from the Russian service to his paternal estate in Hanover in 1818, and died in 1826.

**Bennington** (ben'ing-ton), a town in Vermont, where, on August 16, 1777, General Stark at the head of 1600 American militia was victorious over the British. It has large manufactures of knitted and other goods and a State Soldiers' Home. Pop. 8698.

**Ben-nut,** the seed of *Moringa pterygosperma,* the ben tree of India, yielding the valuable oil of ben. See *Ben, Oil of.*

**Benserade** (bans-rād), ISAAC DE, a French poet at the court of Louis XIV, born in 1613; died in 1691. He wrote a paraphrase of *Job,* various tragedies and comedies, chiefly between 1635 and 1640, and a volume of rondeaux on Ovid's *Metamorphoses,* 1673.

**Benson,** EDWARD FREDERIC, an English novelist, son of Edward White Benson, was born in 1867. He produced *Dodo, The Babe, Mr. Teddy,* etc.

**Benson,** EDWARD WHITE, one of the ablest of English prelates, born at Birmingham, 1829; died in 1896. He became bishop of Truro in 1877, and was consecrated archbishop of Canterbury in 1883.

**Benson,** MONSIGNOR ROBERT HUGH, an English Roman Catholic priest and author, son of Edward White Benson, born at Wellington College, November 18, 1871; died October 19, 1914. He was ordained a priest at Rome in 1904; appointed assistant priest at the church in Cambridge in 1905; and private chamberlain to Pius X, in 1911.

**Benson,** WILLIAM SHEPHERD, an American naval officer (1855- ). He was born at Macon, Ga. He graduated from the U. S. Naval Academy in 1877, gained his captaincy in 1909 and became a rear-admiral in 1915. He served on various assignments at the Naval Academy and afloat. He was commandant of the Philadelphia Navy Yard from 1913 to 1915 and became Chief of Naval Operations on May 11, 1915. In November, 1917, Admiral Benson went abroad as the naval member of a commission sent by President Wilson to confer with the principal Allies.

**Bent-grass,** a name applied to various wiry grasses such as grow on commons and neglected ground and much used for lawns, including species of *Agrostis alba, Agrostis canina, Agropyron junceum,* etc.

**Bentham** (ben'tham), GEORGE, an English botanist, nephew of Jeremy Bentham, born in 1800; died in 1884. He published in French (1826) *The Plants of the Pyrenees and Lower Languedoc,* and with Sir J. D. Hooker he produced the great work of descriptive botany, *Genera Plantarum;* another great

work of his was the *Flora Australiensis*.

**Bentham** (ben'tham), JEREMY, a distinguished writer on politics and jurisprudence, born at London in 1748; educated at Westminster and Oxford; entered Lincoln's Inn, 1763. He was called to the bar, but did not practise, and, having private means, devoted himself to the reform of civil and criminal legislation. A criticism on a passage in Blackstone's *Commentaries*, published under the title *A Fragment on Government*, 1776, brought him into notice. Of his other works the more important were: *The Hard Labor Bill*, 1778; *Principles of Morals and Legislation*, 1789; *A Defense of Usury*, 1787; *Introduction to the Principles of Morals and Legislation*, 1789; *Discourses on Civil and Penal Legislation*, 1802; *Treatise on Judicial Evidence*, 1813, and the *Book of Fallacies*, 1824. His mind, though at once subtle and comprehensive, was characterized by something of the Coleridgean defect in respect of method and sense of proportion: and he is, therefore, seen at his best in works that underwent revision at the hands of his disciples. Of these M. Dumont, by his excellent French translations and rearrangements, secured for Bentham at an early date a European reputation and influence, and his editions are still the most satisfactory. In England James Mill, Romilly, John Stuart Mill, Burton, and others of independent genius, have been among his exponents. In ethics he must be regarded as the founder of modern utilitarianism; in polity and criminal law he anticipated or suggested many practical reforms; and his whole influence was stimulating and humanizing. He died in London, 6th June, 1832.

**Benthos**, the name given to the fixed organisms of ocean and deep lake waters, in distinction to plankton, or floating organic matter. It consists chiefly of algæ, usually attached to stones, thence called lithophytes. It is sparse above low water mark, on account of injurious exposure to atmospheric influences, but rich below this level; the green and brown sea-weeds predominating in the more shallow waters, the red at a greater depth; at great depths all plant life disappears.

**Bentinck** (ben'tink), LORD WILLIAM CAVENDISH. He was the second son of the third Duke of Portland, born in 1774. He served in Flanders, in Italy under Suwaroff, and in Egypt; was governor of Madras 1803–5; and commanded a brigade at Corunna. In 1810 he was British plenipotentiary and commander-in-chief of the troops in Sicily; and in 1813 headed an expedition into Catalonia. In 1814 he endeavored to stimulate a revolt against the French in Italy. From 1829 to 1835 he was governor-general of India. He died in 1839.

**Bentinck**, LORD WILLIAM GEORGE FREDERICK CAVENDISH, son of the fourth Duke of Portland, born in 1802. He entered the army, but quitted it to become private secretary to Canning, and in 1827 entered Parliament. Up to 1846 he was a warm adherent of Sir Robert Peel; but in that year came forward as leader of the Protectionists in the House of Commons, abandoning the turf, in which he had long reigned supreme. With the assistance of Disraeli he maintained this position for two years, and though often illogical, and sometimes unscrupulous in his statements, he nevertheless commanded much attention by the vigor and earnestness of his oratory and deportment. He died in 1848.

**Bentley** (bent'lē), RICHARD, a great English classical scholar and critic, born near Wakefield, Yorkshire, in 1662. At the age of fourteen he entered St. John's College, Cambridge, where he took the degree of B. A. in 1680. In 1682 he became a master of Spalding School, and in the following year was appointed tutor to Dr. Stillingfleet's son. He lived in Dr. Stillingfleet's house during 1683–89, studying deeply, and accompanied his pupil to Oxford. In 1684 he took his M.A. degree at Cambridge, and in 1689 at Oxford, where two years later he won immediate reputation by the publication of his epistle to Mill on the Greek *Chronicle of Malalas*. Dr. Stillingfleet having been raised to the bishopric of Worcester, made Bentley his chaplain, and in 1692 a prebendary in his cathedral. The same year he delivered the first series of the *Boyle Lectures*, his subject being a confutation of atheism. In 1694 he was appointed keeper of the royal library at St. James's Palace, and in 1696 came into residence there. Two or three years after began his famous controversy with the Hon. Charles Boyle, afterwards Earl of Orrery, relative to the genuineness of the Greek *Epistles of Phalaris*, an edition of which was published by Boyle, then a student at Christ Church, Oxford. In this dispute Bentley was completely victorious, though the greatest wits and critics of the age, including Pope, Swift, Garth, Atterbury, Aldrich, Dodwell and Conyers Middleton came to Boyle's assistance. Bentley's *Dissertation on the Epistles of Phalaris* appeared in 1699—'a monument of controversial genius'—'a storehouse of exact and penetrating erudition.' In 1700 he was presented to the mastership of Trinity College, Cambridge, and from this period until 1738 he was at feud with the fellows of that

college. A lawsuit, which lasted more than twenty years, was decided against him, but his opponents were unable to carry out the sentence depriving him of his mastership. In 1711 he published an edition of Horace and in 1713 his remarks on Collins's *Discourse on Free-thinking, by Phileleutherus Lipsiensis.* He was appointed regius professor of divinity in 1716. In 1726 he published an edition of Terence and Phædrus. He meditated an edition of Homer, but left only notes. In Homeric criticism he has the merit of having detected the loss of the letter 'digamma' (which see) from the written texts. His last work was an edition of Milton's *Paradise Lost*, with conjectural emendations (1732). He died in 1742.

**Benton** (ben'tun), THOMAS HART, a statesman, born in or near Hillsborough, North Carolina, in 1782; died at Washington, in 1858. Studying law in Tennessee, he began practice at Nashville about 1811, and while serving as a soldier under General Jackson, in 1812, had a quarrel which led to a duel in which Jackson was severely wounded. He became editor of a political paper in St. Louis, 1815; was elected U. S. Senator from Missouri in 1820, and remained in the Senate until 1851. As such he supported Presidents Jackson and Van Buren, and opposed Calhoun on the subject of nullification. He was elected a member of the House in 1852 and opposed the repeal of the Missouri Compromise. In 1856 he was a candidate for the governorship of Missouri. He published a voluminous and valuable work entitled, *A Thirty Years' View, or a History of the Working of the American Government for Thirty Years*, also *An Abridgment of the Debates of Congress from 1789 to 1856.*

**Ben'ton Harbor,** a city of Berrien County, Michigan, near Lake Michigan, with canal connection. It is the shipping point of a great fruit region, and has important manufactures. There are numerous mineral springs in its vicinity. Pop. 9185.

**Benué,** or BINUÉ (ben'ụ-ā, bin'ụ-ā; 'mother of waters'), a river of Africa the greatest tributary of the Niger, which it enters from the east about 250 miles above its mouth. Dr. Barth came upon the river in 1851, and its course was partly traced by Dr. W. Balfour Baikie, but its source was only reached (by Flegel) in 1883. This lies near lat. 8° N. and lon. 14° E.

**Benyowsky** (ben-i-ov'ski), MAURICE AUGUSTUS, COUNT OF, born in Hungary in 1741; served in the Seven Years' war; and in 1769 was made prisoner while fighting for the Polish Confederacy. Exiled to Kamchatka, he gained the affections of the governor's daughter, who assisted him to escape with his companions in 1771. They visited Japan, Macao, etc., and then went to France. The French government having requested him to form a colony in Madagascar he sailed thither, and was made king in 1776 by the native chiefs. He broke with the French government, sought private aid in England and America, sailed again to Madagascar in 1785, and was killed fighting against the French in 1786. His memoirs were published in 1790.

**Benzerta.** See *Bizerta.*

**Benzene** (ben'zēn; $C_6H_6$), an aromatic liquid hydrocarbon, discovered in 1825 by Faraday, and obtained from coal-tar and petroleum. It may also be got by distilling 1 part of crystallized benzoic acid intimately mixed with 3 parts of slaked lime. It is thin, strongly refractive, and quite colorless, of a peculiar, ethereal, agreeable odor, and boils at 80° C. It is used by manufacturers of India rubber and gutta-percha on account of its great solvent powers, in the preparation of varnishes, and for cleaning gloves, removing grease-spots from woolen and other cloths, etc., on account of its power of dissolving fats and resins. It is highly inflammable and explosive, even the vapor catching fire if it comes in contact with a flame.

**Benzoic Acid** (ben-zō'ik; $C_7H_6O_2$), an organic acid obtained from benzoin and other resins and balsams, as those of Peru and Tolu, and benzene. It forms light, feathery, colorless needles; tastes pungent and bitterish; odor slightly aromatic. It is used for medicinal purposes.

**Benzoic Ether,** a colorless oily liquid, with a feeble aromatic smell and a pungent aromatic taste, obtained by distilling together 4 parts alcohol, 2 of crystallized benzoic acid, and 1 of concentrated hydrochloric acid.

**Benzoin** (ben'zō-in, ben'zoin; Ar. *luban jāwi*, 'Javanese incense'), a solid, brittle, vegetable substance, the concrete resinous juice flowing from incisions in the stem or branches of the *Styrax benzoin*, a tree 70 or 80 feet high, nat. order Styracaceæ. In commerce several varieties are distinguished, of which the yellow, the Siam, the amygdaloidal—the last containing whitish tears of an almond shape—and Sumatra firsts are the finest. It is imported from Siam, Singapore, Bombay, and occasionally from

Calcutta; it is found also in South America. The pure benzoin consists of two principal substances, viz., a resin, and an acid termed *benzoic* (which see). It has little taste, but its smell is fragrant when rubbed or heated, and it is used as incense in the Greek and Roman Catholic

Benzoin Tree (*Styrax benzoin*).

churches. It is insoluble in water, but soluble in alcohol, in which form it is used as a cosmetic, a perfume, and in pharmacy. Benzoin may be produced by the contact of alkalies with the commercial oil of bitter almonds. It is also known as benjamin or gum benjamin.

**Benzole** (-zōl'). Same as *Benzene*.

**Benzoline** (ben'zō-lēn), a name of liquids of the same kind as benzene.

**Beowulf** (bē'o-wụlf), an Anglo-Saxon epic, the only existing MS. of which belongs to the eighth or ninth century, and is in the Cottonian Library (British Museum). From internal evidence it is concluded that the poem in its essentials existed prior to the Anglo-Saxon colonization of Britain, and that it must be regarded either as brought to Britain by the Teutonic invaders, or as an early Anglo-Saxon translation of a Danish legend. From the allusions in it to Christianity, however, it must have received considerable modifications from its original form. It recounts the adventures of the hero Beowulf, especially his delivery of the Danish kingdom from the monster Grendel and his equally formidable mother, and, finally, the slaughter by Beowulf of a fiery dragon, and his death from wounds received in the conflict. The character of the hero is attractive through its noble simplicity and disregard of self. The poem, which is the longest and most important in Anglo-Saxon literature, is in many points obscure, and the MS. is somewhat imperfect.

**Béranger** (bā-rāṇ-zhā), PIERRE JEAN DE, a distinguished French lyric poet, born in Paris 1780. His father was a restless and scheming man, and young Béranger, after witnessing from the roof of his school the destruction of the Bastille, was placed under the charge of an aunt who kept a tavern at Peronne. At the age of fourteen he was apprenticed to a printer in Peronne, but was ultimately summoned to Paris to assist his father in his financing and plotting. After many hardships he withdrew in disgust from that atmosphere of chicanery and intrigue in which he found himself involved, betook himself to a garret, did what literary hack-work he could, and made many ambitious attempts in poetry and drama. Reduced to extremity, he applied in 1804 to Lucien Bonaparte for assistance, and succeeded in obtaining from him, first, a pension of 1000 francs, and five years later a university clerkship. Although as yet unprinted, many of his

Béranger.

songs had become extremely popular, and in 1815 the first collection of them was published. A second collection, published in 1821, made him obnoxious to the Bourbon government, and in addition to being dismissed from his office in the university he was sentenced to three months' imprisonment and a fine of 500 francs. A third collection appeared in 1825, and in 1828 a fourth, which subjected him to a second state prosecution, an imprisonment of nine months, and a fine of 1100 francs. In 1833 he published his fifth and last collection, thereafter remaining silent till his death. Shortly after the revolution of February, 1848, he was elected representative of the department of the Seine in the constituent assembly, but sent in his resignation in the month of May of same year. He died at Paris on July 16, 1857. From first to last he kept in sympathetic touch with the French people in all their humors, social and

political, influencing men in the mass more than any lyric poet of modern times. In private life he was the most amiable and benevolent of men, living unobtrusively with his old friend Judith Frère, who died a few months before him.

**Berar** (bă-rar'), otherwise known as the Hyderabad Assigned Districts, a commissionership of India, in the Deccan, area, 17,711 square miles, consisting chiefly of an elevated valley at the head of a chain of ghauts. It is watered by several affluents of the Godavari and by the Tapti, and has a fertile soil, producing some of the best cotton, millet, and wheat crops in India. The two principal towns of Berar are Amráoti (pop. 35,000) and Ellichpur (26,000). Coal and iron-ore are both found in the province, the pop. of which is 2,750,000. Berar was assigned by the Nizam to the British government in 1853 in security of arrears due. The old Kingdom of Berar was much more extensive.

**Berat** (ber-at'), a fortified town in the principality of Albania, situated about 30 miles northeast of the port of Avlona. It produces grain, oil and wine in abundance. Pop. 15,000.

**Berber,** a town on the right bank of the Nile, in the Egyptian Soudan, about 20 miles below the confluence of the Atbara, an important station for merchants on the route from Sennaar and Khartoum to Cairo, and also from Suakim. Pop. 10,000.

**Berbera** (ber'be-ra), the chief seaport and trading place of British Somaliland, East Africa, on a bay affording convenient anchorage in the Gulf of Aden. An important fair, which lasts for some months, is held here, increasing the population from 10,000 to about 30,000. It came into British possession in 1885.

**Berberin** (ber'be-rin), a golden-yellow coloring matter obtained from several species of Berberis or barberry.

**Berberis** (ber'be-ris), a genus of plants, type of the nat. order Berberidaceæ or barberries. See *Barberry*.

**Berbers,** a people spread over nearly the whole of Northern Africa, from whom the name *Barbary* is derived. The chief branches into which the Berbers are divided are, first, the Amazirgh or Amazigh, of Northern Morocco, though for the most part quite independent of the Sultan of Morocco, living partly under chieftains and hereditary princes and partly in small republican communities. Second, the Shuluh, Shilooh, or Shellakah, who inhabit the south of Morocco. They are more highly civilized than the Amazirgh. Third, the Kabyles in Algeria and Tunis; and fourth, the Berbers of the Sahara, who inhabit the oases. Among the Sahara Berbers the most remarkable are the Beni-Mzâb and the Tuaregs. They are believed to represent the ancient Mauritanians, Numidians, Gætulians, etc.

**Berbice** (ber-bēs'), a district of British Guiana watered by the river Berbice, and containing the town of Berbice or New Amsterdam, which has three churches and several public buildings.

**Berchta** (ber*h*'tä; *i. e.*, Bertha), in the folk-lore of S. Germany, a sort of female hobgoblin of whom naughty children are much afraid. Her name is connected with the word *bright*, and originally she was regarded as a goddess of benign influence.

**Berchtesgaden** (ber*h*'tes-gä-dĕn), a town, Upper Bavaria, on the Achen or Alben in a beautiful situation, with a royal palace and villa, an ancient church, etc. There are important salt-mines in the neighborhood, and the people are also renowned for artistic carvings in wood. Pop. 10,046.

**Berdiansk** (bĕr-di-ansk'), a seaport of Southern Russia, gov. of Taurida, on the north shore of the Sea of Azof, with an important export and inland trade. Pop. 29,168.

**Berdichef** (bĕr-dē'chef; Pol. *Berdyczew*), a city of European Russia, gov. of Kiev, with broad streets, well-built houses, numerous industrial establishments, and a very large trade, having largely attended fairs. Pop. 53,728, chiefly Jews.

**Berea College,** a coeducational institution in Kentucky on the edge of the Cumberland Mountains. In 1916 the students enrolled in the five departments numbered 1350.

**Bereans** (ber-ē'ans; or Barclayans, from their founder, Barclay), an insignificant sect of dissenters from the Church of Scotland, who profess to follow the ancient Bereans (see Acts, xvii, 10-13) in building their faith and practice upon the Scriptures alone, without regard to any human authority whatever.

**Berengarius** (be-ren-gā'ri-us) of Tours, born 998 at Tours, a teacher in the philosophical school in that city, and in 1040 Archdeacon of Angers; renowned for his philosophical acuteness as one of the scholastic writers, and also for the boldness with which, in 1050, he declared himself against the doctrine of transubstantiation, and for his consequent persecutions. He was several times compelled to recant, but always returned to the same opinions, until he

was compelled, in 1080, by the opposition of Lafranc, to retire to the Isle of St. Cosmas, near Tours, where he died in 1088. This Berengarius must not be confounded with Peter Berenger of Poitiers, who wrote a defense of his instructor Abelard.

**Berenice** (ber-e-nī'sē), 'bringer of victory', the name of several distinguished women of antiquity; in particular the wife of Ptolemy Euergētes, King of Egypt. When her husband went to war in Syria she made a vow to devote her beautiful hair to the gods if he returned safe. She accordingly hung it in the temple of Venus, from which it disappeared, and was said to have been transferred to the skies as the constellation *Coma Berenices*. Also the daughter of Agrippa I, King of Judah, 37-44 A. D. During the Roman occupation she is said to have won a promise of marriage from Titus, never fulfilled.

**Berenice** (ber-e-nī'sē), anciently a town on the Egyptian coast of the Red Sea, a place of great trade.

**Berenson,** BERNHARD, author and art critic, was born at Wilma, Russia, in 1865; came to the United States with his parents and was educated at the Boston Latin School and Harvard University. He graduated in 1887 and went to Italy to study Italian painting. He became an authority on the subject and contributed many articles to the art journals of Italy, Germany and France. Among his published works are: *Venetian Painters of the Renaissance, Lorenzo Lotto, Florentine Painters, Central Italian Painters, A Siennese Painter of the Franciscan Legend.*

**Beresford,** ADMIRAL LORD CHARLES DE LA POER, British naval officer and parliamentarian, son of Rev. John, fourth Marquess of Waterford; born in the county of Waterford, Ireland, in 1846. He commanded the *Condor* which bombarded Alexandria in 1882, and following the bombardment he instituted a regular police system in Egypt. He served with Lord Wolseley on the Nile Expedition, 1884-85, and was in command of the naval brigade at Abu Klea, Abu Kru, and Metemmeh. He became rear-admiral of the Mediterranean fleet in 1900; commanded the Channel Squadron, 1903-05; was promoted to Admiral in 1906. From 1905 to 1909 he was commander-in-chief of the Mediterranean and Channel fleets. He retired in 1911. He served as Member of Parliament for Waterford from 1874 to 1880; East Marylebone, from 1885 to 1890; York, 1897 to 1900; Woolwich, 1902. In his book, *The Betrayal*, he was outspoken in condemnation of the shipbuilding policy of Great Britain; it stirred up the government and led to the formation of the British Naval War Staff. Author of *Life of Nelson, The Break-up of China, The Betrayal*, etc.

**Beresford** (ber'es-ford), WILLIAM CARR, VISCOUNT, a distinguished commander, a natural son of the first Marquis of Waterford; born in 1768. He entered the army, lost an eye in Nova Scotia, served at Toulon, and in Corsica, the West Indies, and Egypt. In 1806, as brigadier-general, he commanded the land force in the expedition to Buenos Ayres; and in 1808 remodeled the Portuguese army, receiving in return the titles Marshal of Portugal, Duke of Elvas, and Marquis of Santo Campo. He was subsequently engaged at Badajoz, Salamanca, Vittoria, and Bayonne, and for his bravery at the battle of Toulouse was raised to the peerage with the title of Baron (Viscount, 1823) Beresford. He died in 1854.

**Beretta.** See *Biretta.*

**Berezina** (ber-ez'i-na), BERESINA, a tributary of the Dnieper, in the Russian province of Minsk, rendered famous by the disastrous passage of the French army under Napoleon during the retreat from Moscow, Nov. 27-29, 1812.

**Berezov** (ber-yoz'ov), a town in Western Siberia, government of Tobolsk, on a branch of the Obi, the entrepôt of a large fur and skin district. Pop., chiefly Cossack, 1073.

**Berg,** an ancient duchy of Germany, on the Rhine. Now included in governments Arnsberg, Cologne, and Düsseldorf.

**Bergama** (ber'gà-mà; ancient *Pergamus*), a town of Turkey in Asia, north of Smyrna; contains fine ruins of a Roman palace, etc. Pop. est. from 6000 to 20,000.

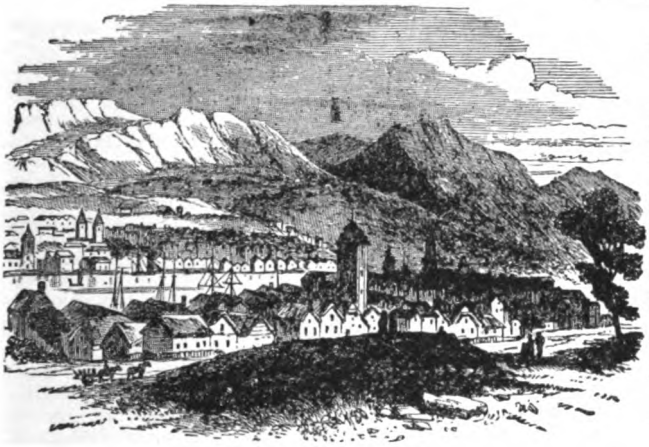
**Bergamo** (ber'ga-mō), a town of North Italy, capital of the Province of Bergamo. Pop. 26,660. The comic characters in the Italian masked comedy are Bergamese, or affect the Bergamese dialect.

**Bergamot** (ber'ga-mot), a fruit-tree, a variety or species of the genus *Citrus*, variously classed with the orange, *Citrus aurantium*, the lime, *Citrus limetta*, or made a distinct species as *Citrus bergamia*. It is probably of Eastern origin, though now grown in S. Europe, and bears a pale-yellow pear-shaped fruit with a fragrant and slightly acid pulp. Its essential oil is in high esteem as a perfume.—*Bergamot* is also a name given to a number of different pears. The name is commonly used for

the mint *Monarda fistulosa*, because of its odor.

**Bergedorf** (ber'gheh-dorf), a town in the territory of Hamburg, 10 miles E. S. E. of the city of Hamburg. Pop. 23,728.

**Bergen** (ber'gen), a seaport on the w. coast of Norway, the second town of the kingdom, about 25 miles from the open sea, on a bay of the Byfiord, which forms a safe harbor, shut in by hills which encircle the town on the land side, and promote perpetual rains. It has a very mild climate for its latitude. The town is well built, but has many narrow streets, and houses mostly of wood; with cathedral, museum, etc. The trade is large, timber, tar, train-oil, cod-liver oil, hides, and dried fish, being exported. Pop. 72,179.



Bergen, from the Northwest.

**Bergen-op-zoom** (ber'gen-op-zōm), a town, Holland, in a marshy situation on the Scheldt, 20 miles N. N. W. of Antwerp. Pop. 13,668.

**Berger,** VICTOR L., first Socialist elected to Congress (1911), was born at Nieder Rebbuch, Austro-Hungary, 1860, emigrated to America, and after working at various trades became editor of a Socialist paper in Milwaukee. He was elected to the Sixty-second Congress (1911-13) from the Fifth Wisconsin district. Ran for Senator in 1918, but was defeated. He was arrested under the Espionage Act, charged with attempting to interfere with the operation of the Selective Draft Law in 1918.

**Bergerac** (bārzh-rák), a town of the department of the Dordogne, France. It gives its name to the wine of the Dordogne district, sometimes termed in France *petit champagne*. Pop. 10,545.

**Bergh** (burg), HENRY, humanitarian, was born in New York in 1823. Becoming interested in the treatment of domestic animals, he succeeded, in 1866, in having incorporated the American Society for the Prevention of Cruelty to Animals. The humane work successfully carried on by Mr. Bergh soon enlisted the sympathies of women, and among his ablest assistants and most generous donors were ladies moving in the highest social circles in New York and elsewhere. He died in 1888.

**Berghaus** (ber*h*'house), HEINRICH, a German geographer, born 1797, died 1884. He served in 1815 in the German army in France, and was from 1816 to 1821 employed in a trigonometrical survey of Prussia under the war department. From 1824 to 1855 he was professor of applied mathematics in the Berlin Academy of Architecture. Besides his various maps and his great *Physical Atlas*, he published *Allgemeine Länder- und-Völkerkunde* (6 vols.), 1837–41; *Die Völker des Erdballs* (2 vols.), 1852; *Grundlinien der physikalischen Erdbeschreibung*, 1856; *Grundlinien der Ethnographie*, 1856; *Deutschland seit hundert Jahren* (5 vols.), 1859–62; *Was man von der Erde Weiss* (4 vols.), 1856–60; *Sprachschatz der Sassen*, or Low German dictionary (left incomplete), etc.

**Berghem** (ber*h*'hem), NICHOLAS, painter, born at Harlem in 1624, pupil of his father, Peter Klaas, and also of Van Goyen and the elder Weenix. He produced a large number of works, chiefly landscapes with cattle, of which eleven are in the Louvre, eighteen at St. Petersburg, etc. He died at Harlem, 1683. Dujardin was among his pupils.

**Bergk** (berk), THEODORE, a German classical scholar, born in 1812, died 1881. He was successively professor at Marburg, Freiburg, and Halle, and later resided at Bonn. He rendered most

service in the criticism and explanations of Greek lyric poetry.

**Bergman** (ber*h*'mán), TORBERN OLOF, a Swedish physicist and chemist, born in 1735; died in 1784. He studied under Linnæus at Upsala; in 1758 became doctor of philosophy and professor of physics there; and in 1767 became professor of chemistry. He succeeded in the preparation of artificial mineral waters, discovered the sulphuretted hydrogen gas of mineral springs, and published a classification of minerals on the basis of their chemical character and crystalline forms. His theory of chemical affinities greatly influenced the subsequent development of chemistry.

**Bergmehl** (bėrg'māl), mountain-meal or fossil farina, a geological deposit (fresh-water) in the form of an extremely fine powder, consisting almost entirely of the siliceous frustules or cell-walls of diatoms. It is a variety of diatomite (which see).

**Bergson** (bėrg'son), HENRI LOUIS, a French philosopher, born in Paris in 1859, and since 1900 professor of philosophy in the Collège de France. His writings, of which *Creative Evolution* is the most popular, are marked by great lucidity and richness of style. Bergson holds that the fulness of reality cannot be grasped by the intellect because the universe is continually changing, whereas concepts are fixed.

**Bergylt** (ber'gilt; *Sebastes marinus*), a name given in Shetland to the rose-fish, a fish of the family Scorpænidae, of a beautiful reddish color, sometimes found on the British coasts, and called Norway haddock and Norway carp.

**Berhampur** (bėr-am-pu̧r'), the name of two Indian towns: 1. A town and military station in the northeast portion of Madras presidency, the headquarters of Ganjám district, with a trade in sugar and manufactures of silks. Pop. about 25,000.—2. A municipal town and the administrative headquarters of Murshidábád district, Bengal; formerly a military station, and having still large barracks. It was the scene of the first overt act of mutiny in 1857. Pop. about 25,000.

**Beriberi** (ber'-i-ber-i), a disease endemic in parts of India, Ceylon, Japan, etc., characterized by paralysis, numbness, difficult breathing, and often other symptoms, attacking strangers as well as natives, and frequently fatal; thought to be due to eating of rice entirely rather than a mixed diet. It is now less frequent in Japan since rice is not the only food of the people.

**Be'ring.** See *Behring*.

**Berkeley** (bėrk'li), a town of Alameda Co., California, 7 miles N. E. of San Francisco, and near the bay. Here is the University of California and the Agricultural College; also the State institution for the deaf, dumb, and blind. With the university, a flourishing institution, is connected the Lick Observatory at Hamilton. It has large soap works and various other manufactures. Pop. 40,434.

**Berkeley** (bėrk'li), GEORGE, a famous metaphysical philosopher, celebrated for his ideal theory of philosophy. He was born in Ireland in 1685 (his father being an officer of customs); became fellow of Trinity College, Dublin, in 1707; in 1721 was appointed chaplain to the Lord-lieutenant of Ireland, the Duke of Grafton. By a legacy from Miss Vanhomrigh (Swift's Vanessa) in 1723 his fortune was considerably increased. In 1724 he became Dean of Derry. He now published his *Proposals for the Conversion of the American Savages to Christianity by the Establishment of a College in the Bermuda Islands;* and subscriptions having been raised, he set sail for Rhode Island in 1728, proposing to wait there till a promised grant of £20,000 had been got from government. The scheme never got a start, however, and he returned, now receiving the bishopric of Cloyne. He died suddenly at Oxford in 1753. Berkeley holds an important place in the history of philosophy. He maintains that the belief in the existence of an exterior material world is false and inconsistent with itself; and those things which are called *sensible material objects* are not external but exist in the mind, and are merely impressions made on our minds by the immediate act of God, according to certain rules termed *laws of nature*, from which he never deviates; and that the steady adherence of the Supreme Spirit to these rules is what constitutes the reality of things to his creatures, and so effectually distinguishes the ideas perceived by sense from such as are the work of the mind itself or of dreams, that there is no more danger of confounding them together on this hypothesis than on that of the existence of matter. Berkeley was admirable as a writer; as a man he was said by his friend Pope to be possessed of 'every virtue under heaven.' His most celebrated philosophical works are: *Essay towards a New Theory of Vision*, 1709; a *Treatise on the Principles of Human Knowledge*, 1710, in which his philosophical theory is fully set forth; *Three Dia-*

*logues between Hylas and Philonous*, 1713; *Alciphron, or the Minute Philosopher*, 1732; and *Siris, Philosophical Reflections and Inquiries concerning the Virtues of Tar-water*, 1744. There were others of a mathematical and theological order, the only complete edition being that of Fraser, 3 vols. 1871.

**Berkeley,** GEORGE CHARLES GRANTLEY FITZHARDINGE, a British author, sixth son of the fifth Earl of Berkeley, but second son after the legally recognized marriage; born in 1800. From 1832-52 he was Liberal member for West Gloucestershire. He became notorious in 1836 for his assault upon Fraser, the publisher, and his duel with Maginn for a hostile review in Fraser's Magazine of his first novel, *Berkeley Castle*. Besides other stories, poems, and works upon travel, sport, etc., he published in 1865–66 his *Life and Recollections* in 4 vols., and in 1867 a volume of reminiscences entitled *Anecdotes of the Upper Ten Thousand*—both of which gave rise to much discussion. He died in 1881.

**Berkshire** (bêrk'shir), or BERKS, a county of England, between Oxfordshire, Buckinghamshire, Surrey, Hampshire, and Wilts; area 705 sq. miles, of which eight-ninths are cultivated or under timber. A range of chalk hills, entering from Oxfordshire, crosses Berkshire in a westerly direction. The western and central parts are the most productive in the county, which contains rich pasturage and excellent dairy farms, and is especially suited for barley and wheat crops. The Thames skirts the county on the north, and connects the towns of Abingdon, Wallingford, Reading, Henley, Maidenhead, and Windsor with the metropolis. Few manufactures are carried on, the principal being agricultural implements and artificial manures, flour, paper, sacking and sail-cloth, and biscuits (at Reading). Malt is made in great quantities. The minerals are unimportant. Pop. 195,814.

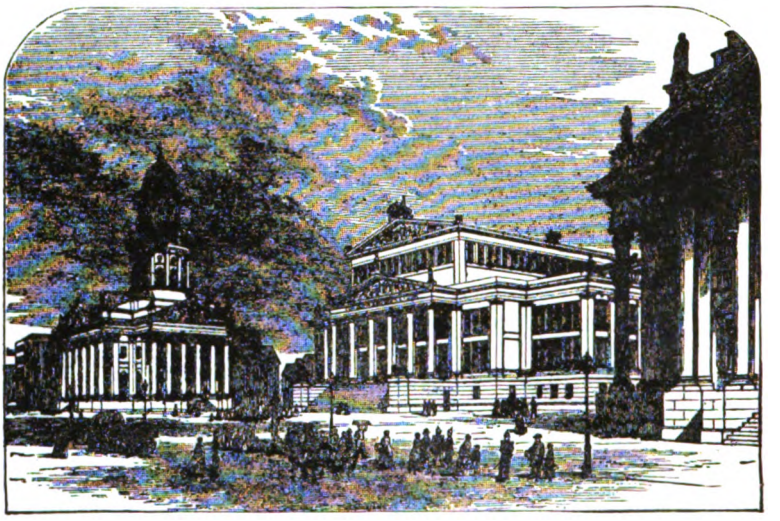
**Berlad** (bêr'lad), a town of Rumania, on the Berlad, a navigable tributary of the Sereth. Has a large trade in maize. Pop. 24,484.

**Berlengas** (bêr-lên'gas), a group of about twelve rocky islands, off the coast of Portugal.

**Berlichingen** (ber'li-hing-ên), GÖTZ or GODFREY VON, 'of the Iron Hand'; born at Jagsthausen, in Suabia, in 1480. He took part in various quarrels among the German princes; and having lost his right hand at the siege of Landshut, wore thereafter one made of iron. In constant feud with his baronial neighbors, and even with free cities like Nuremberg, he at last headed the insurgents in the Peasants' War of 1525, and suffered imprisonment on their defeat. After the dissolution of the Suabian League he again fought against the Turks (1541) and the French (1544). He died in 1562. His autobiography, printed at Nuremberg in 1731, furnished Goethe with the subject for his drama, *Goetz von Berlichingen*.

**Berlin** (ber-lin'), capital of the Prussian dominions and of the German Empire and much the largest city in Germany, formerly in the province of Brandenburg, lies on a sandy plain on both sides of the Spree, a sluggish stream, here about 200 feet abroad. It has water communication to the North Sea by the Spree, which flows into the Havel, a tributary of the Elbe, and to the Baltic by canals connecting with the Oder. The original portion of the city lies on the right bank of the river, and is irregularly built. The more modern portion is regular in its plan, and the streets are lined with lofty and well-built edifices mostly of handsome architectural design and constructed of solid materials. Of the numerous bridges, the finest is the Castle (Schloss) Bridge, 104 feet wide, and having eight piers surmounted by colossal groups of sculpture in marble. The principal and most frequented street, Unter den Linden ('under the lime-trees'), is about a mile in length and 160 feet wide, the center being occupied by a double avenue of lime-trees. At the E. end of this street, and round the Lustgarten, a square with which it is connected by the Schloss Bridge, are clustered the principal public buildings of the city, such as the royal palace, the palace of the crown-prince, the arsenal, the university, the museums, royal academy, etc.; while at the W. end is the Brandenburg Gate, regarded as one of the finest portals in existence. Immediately beyond this gate is the Thiergarten (zoological garden), an extensive and well-wooded park containing the palace of Bellevue and places of public amusement. There are also several other public parks, and a zoological garden which ranks with the best in the world, also important natural history, ethnographical and other museums. The principal public buildings are the royal palace or Schloss, a vast rectangular pile, the museum (opposite the Schloss), a fine Grecian building, with an extensive collection of sculpture and painting; the royal theater is also a fine Grecian edifice. The royal library and palace of the emperor are united; the former contains above 1,000,000 volumes and 30,000 manuscripts and charts. The arsenal

(Zeughaus), besides arms and artillery, contains flags and other trophies of great antiquity. The university, the exchange, the Italian opera-house, the principal Jewish synagogue, the town-hall, and the old architectural academy are all beautiful structures. The town contains altogether about twenty-five theaters, thirty hospitals, sixteen barracks, ten or twelve cemeteries, etc. The prevailing style of the newer buildings, both public and private, is Grecian, pure or Italianized. One of the most remarkable of modern monuments is that erected in 1851 to Frederick the Great in the Unter den Linden —the *chef-d'œuvre* of Rauch and his pupils. The literary institutions of the city are numerous and excellent; they include the university, having an educational staff of about 500 professors and teachers, and attended by nearly 8000 students and 7000 'hearers'; the academy of sciences; the academy of fine arts; and the technical high school or academy of architecture and industry (occupying a large new building in the suburb of Charlottenburg). The manufactures are various and extensive, including steam-engines and other machinery, brass-founding and various articles of metal, sewing-machines, paper, cigars, pottery and porcelain, pianos and harmoniums, artificial flowers, etc. In the royal iron-foundry busts, statues, basreliefs, etc., are cast, together with a great variety of ornaments of unrivaled delicacy of workmanship. The older parts of the city were originally poor villages, and first rose to some importance under Markgraf Albert (1106–1170), yet about two centuries ago Berlin was still a place of little consequence, the first important improvement being made by the great Elector Frederick William, who planted the Unter den Linden, and in whose time it already numbered 20,000 inhabitants. Under his successors Frederick I and Frederick the Great the city was rapidly enlarged and improved, the population increasing fivefold in the hundred years preceding the death of Frederick the Great and tenfold in the century succeeding it. The population within recent years has rapidly increased, and was estimated in 1910 at 2,064,153.



Berlin—Royal Theater and New Church in the Gensdarmenmarkt.

**Berlin,** Congress of. The preliminary treaty of San Stefano, concluded between Russia and Turkey after the war of 1877-78, was so greatly in favor of Russia that the remaining great Powers objected to its terms, and a congress was convened at Berlin in June, 1878, to consider and modify these terms. The Powers represented were Great Britain, France, Germany, Austria, Italy, Russia and Turkey.

**Berlin,** Treaty of. The Congress of Berlin ended in a treaty, signed

July 13, 1878, in which the severe terms exacted by Russia were modified, but the power of Turkey in Europe much reduced. Rumania, Servia and Montenegro, were made independent states, Bulgaria was made an autonomous but tributary province, Eastern Rumelia was granted administrative autonomy, and Bosnia and Herzegovina were placed under Austrian administration. Greece gained an accession of territory and Bessarabia was restored to Russia.

**Berlin,** a four-wheeled carriage for two occupants.

**Berlin,** a city of Wisconsin, in Green Lake and Waushara counties. Pop. 5000.

**Berlin,** a thriving city in Coos Co., New Hampshire, 98 miles N. W. of Portland; incorporated in 1890. It has pulp and paper mills and abundant water-power. Pop. 11,780.

**Berlin,** a town of Canada, prov. Ontario, about 60 miles w. s. w. of Toronto, with some manufactures. Pop. (1911) 15,600.

**Berlin Blue.** See *Blue.*

**Berlin Spirit,** a coarse spirit distilled from potatoes, beets, etc.

**Berlioz** (ber-li-os), HECTOR, a French composer, born in 1803. He forsook medicine to study music at the Paris Conservatoire, where he gained the first prize in 1830 with his cantata *Sardanapale.* For about two years he studied in Italy, and when on his return he began to produce his larger works, he found himself compelled to take up the pen both in defense of his principles and for his own better maintenance. As critic of the *Journal des Debats* and feuilletonist he displayed scarcely less originality than in his music, his chief literary works being the *Traité d'Instrumentation,* 1844; *Voyage Musical,* 1845; *Les Soirées d'Orchestre,* 1853; and *A travers Chant,* 1862. His musical works belong to the Romantic school, and are specially noteworthy for the resource they display in orchestra coloring. The more important are *Harold en Italie; Episode de la Vie d'un Artiste, and Le Retour à la Vie; Romeo and Juliette,* 1834; *Damnation de Faust,* 1846; the operas *Benvenuto Cellini, Beatrice and Benedict,* and *Les Troyens; L'Enfance du Christ,* and the *Te Deum.* He married an English actress, Miss Smithson, but later lived apart from her. He died in 1869. After his death appeared *Mémoires* written by himself.

**Berm,** in fortification, a level space a few feet wide between the outside slope of a rampart and the scarp of the ditch.

**Bermondsey** (ber'mond-si), a parl. division of London, on the Surrey side of the Thames, between Southwark and Rotherhithe. Has large tan-yards and wharfs. Pop. 125,960.

**Bermuda Grass** (ber-mū'da), *Capriola dactylon,* a grass cultivated in the West Indies, United States, etc., a valuable pasture grass in warm climates owing to its resistance to the effects of droughts.

**Bermudas,** or SOMERS ISLANDS, a cluster of small islands in the Atlantic Ocean belonging to Britain, and numbering over 300, of which only a few are inhabited. They occupy a space of about 20 miles long and 6 wide, the total area being 19½ sq. miles. They were first discovered by Juan Bermudez, a Spaniard, in 1522; in 1609 Sir George Somers, an Englishman, was wrecked here, and, after his shipwreck, formed the first settlement. The most considerable are St. George, Bermuda or Long Island (with the chief town Hamilton, the seat of the governor), Somerset, St. David's and Ireland. They form an important British naval and military station. An immense iron floating-dock, capable of receiving a vessel of large tonnage, was towed from London to the Bermudas in 1868. The climate is generally healthy and delightful, but they have been sometimes visited by yellow fever. Numbers of persons from the United States and Canada now pass the colder months of the year in these islands. About 4000 acres are cultivated. The soil, though light, is in general rich and fertile; there is, however, little fresh water except rain-water, preserved in cisterns. The inhabitants cultivate and export potatoes, arrow-root, onions, bananas, tomatoes, etc. Oranges and other fruits are also cultivated. The military usually stationed here number about 1500 men. Bermuda exports great quantities of lilies to the United States. Pop. in 1911 18,994, of whom 6691 were whites.

**Bern,** a town in Switzerland, capital of the canton Bern, and, since 1848, of the whole Swiss Confederation, stands on the declivity of a hill washed on three sides by the Aar. The principal street is wide and adorned with arcades and curious fountains; the houses generally are substantially built of stone. Among the public buildings are the great Gothic cathedral, built between 1421 and 1502, and restored in 1887; the federal-council buildings; the old fortifications, commanding a splendid view of the Alps; the university; the town-house, a Gothic edifice of the fifteenth century; the mint, etc. Bern has an academy and several

literary societies, and an excellent public library. Trade and commerce lively; manufactures: woolens, linens, silk stuffs, stockings, watches, clocks, toys, etc. Few cities have finer promenades, and the environs are very picturesque. Bern became a free city of the empire in 1218. In 1353 it entered the Swiss Confederacy. Pop. 80,095.—The canton of Bern has an area of 2657 square miles. The northern part belongs to the Jura mountain system, the southern to the Alps; between these being an elevated undulating region where is situated the Emmenthal, one of the richest and most fertile valleys in Switzerland. The southern part of the canton forms the Bernese Oberland (Upperland). The lower valleys here are fertile and agreeable; higher up are excellent Alpine pastures; and above them rise the highest mountains of Switzerland (Finsteraarhorn, Schreckhorn, Wetterhorn, Eiger, and Jungfrau). The canton is drained by the Aar and its tributaries; the chief lakes are those of Brienz, Thun, and Bienne. Of the surface over 58 per cent is under cultivation or pasture. Agriculture and cattle-rearing are the chief occupations; manufactures embrace linen, cotton, silk, iron, watches, glass, pottery, etc. Bienne and Thun are the chief towns after Bern. Pop. 642,215, six-sevenths being Germans and a still larger proportion Protestant.

**Bernadotte** (ber-nä-dot), JEAN BAPTISTE JULES, a French general, afterwards raised to the Swedish throne, was the son of an advocate of Pau, born in 1763. He enlisted at seventeen, became sergeant-major in 1789, and subaltern in 1790. In 1794 he was appointed a general of division, and distinguished himself greatly in the campaign in Germany, and on the Rhine. In 1798 he married Mademoiselle Clary, sister-in-law of Joseph Bonaparte. In the following year he was for a short time minister of war, and on the establishment of the empire was raised to the dignity of marshal of France, with the title of Prince of Ponte-Corvo. In 1810, partly on account of his great popularity, the heir apparency to the Swedish crown was offered to the Prince of Ponte-Corvo, who accepted with the consent of the emperor, went to Sweden, abjured Catholicism, and took the title of Prince Charles John. In the maintenance of the interests of Sweden a serious rupture occurred between him and Bonaparte, followed in 1812 by his joining the coalition of sovereigns against Napoleon. At the battle of Leipsic he contributed effectually to the victory of the allies. At the close of the war strenuous attempts were made by the Emperor of Austria and other sovereigns to restore the family of Gustavus IV to the crown; but Bernadotte, retaining his position as crown-prince, became King of Sweden on the death of Charles XIII in 1818, under the title of Charles XIV. During his reign agriculture and commerce made great advances, and many important public works were completed. He died 8th March, 1844, and was succeeded by his son Oscar.

**Bernard** (ber-när), CHARLES DE, a French novelist of the school of Balzac, born in 1804; died in 1850. His best works were: *Le Gerfaut*, 1838; *La Peau du Lion*, 1841; and *Le Gentilhomme Campagnard*, 1847. Many of his earlier works, however, are also widely known, especially the *Nœud Gordien*. He also wrote poems and dramatic pieces.

**Bernard** (ber-när), CLAUDE, a French physiologist, born in 1813; studied at Paris; held in succession chairs of physiology in the Faculty of Sciences, the College of France, and the Museum, and died at Paris in 1878. Amongst his many works may be cited his *Researches on the Functions of the Pancreas*, 1849, and *Researches on the Sympathetic System*, 1852.

**Bernard** (bĕr'närd), EDWARD, English scholar, born 1638; died 1697. He was Savilian professor of astronomy at Oxford 1673–91.

**Bernard** (bĕr'närd), SIR FRANCIS, Colonial governor, born in 1714, in England; died there 1779. In 1758 he was appointed governor of New Jersey, and transferred to Massachusetts in 1760, where he made himself unpopular among the Colonists by his support of all measures obnoxious to the Colonists. When he left Boston on his recall to England, as a token of the rejoicing of the people, bells were rung, cannon were fired and the 'Liberty-tree' was hung with flags.

**Bernard** (ber-när), SIMON, military officer, born in France 1779. He came to the United States in 1824 with Lafayette. While chief engineer of the United States army he built Fort Monroe, and had a part in the construction of the Chesapeake and Ohio Canal and the Delaware Breakwater.

**Bernard, GREAT ST.**, a celebrated Alpine pass in Switzerland, canton Valais, on the mountain-road leading from Martigny in Switzerland to Aosta in Piedmont, and rising to a height of 8150 feet. Almost on the very crest of the pass is the famous Hospice. The buildings are substantially built of stone and are capable of accommodating seventy or eighty travelers with beds, and of sheltering 300, and is tenanted by a number of brethren of the order of St. Augustine. The hospice is connected with a station in the valley below, from which the monks are warned by telephone when

travelers are on their way up the mountain. The construction of railways has greatly diminished the importance of the pass. The dogs kept at St. Bernard, to assist the brethren in their humane labors, are well known. The true St. Bernard dog was a variety by itself, but this is now extinct, though there are still descendants of the last St. Bernard crossed with other breeds, to conform as much as possible to the original breed. The color of these great dogs is reddish or orange, marked with white on muzzle, neck, chest, feet, and tip of tail; head large and broad, muzzle short, lips somewhat pendulous, hanging ears. A pagan temple formerly stood on the pass, and classic remains are found in the vicinity. The hospice was founded in 962 by St. Bernard of Menthon, an Italian ecclesiastic, for the benefit of pilgrims to Rome. In May, 1800, Napoleon led an army, with its artillery and cavalry, into Italy by this pass.

**Bernard,** LITTLE ST., a mountain of Italy, belonging to the Graian Alps, about 10 miles S. of Mont Blanc. The pass across it, one of the easiest in the Alps, is supposed to be that which Hannibal used. Elevation of Hospice, 7192 feet.

**Bernard,** SAINT, of Clairvaux, one of the most influential ecclesiastics of the middle ages, born at Fontaines, Burgundy, in 1090, of noble descent. In 1113 he became a monk at Citeaux; in 1115 first abbot of Clairvaux, the great Cistercian monastery near Langres. His austerities, tact, courage and eloquence speedily gave him a wide reputation; and when, on the death of Honorius II (1130), two popes, Innocent and Anaclete, were elected, the judgment of Bernard in favor of the former was accepted by nearly all Europe. In 1141 he secured the condemnation of Abelard for heresy; and after the election of his pupil, Eugenius III, to the papal chair, he may be said to have exercised supreme power in the church. After the capture of Edessa by the Turks he was induced to preach a new crusade, which he did (1146) so effectively as to raise a large host, which, however, met with disaster and death. He died Aug. 20, 1153. Over seventy monasteries owed their foundation or enlargement to him; and he left many epistles, sermons, and theological and moral treatises. A number of hymns ascribed to him survive, among them being, *Jesu dulcis memoria*, and *Salve caput cruentatum*. Canonized in 1174.

**Bernard de Ventadour,** a troubadour of the twelfth century. The son of a domestic servant, he was detected in an amour with the wife of his master, the Comte de Ventadour, and took refuge at the court of Raymond V, Comte de Toulouse. His songs, which were praised by Petrarch, are yet highly esteemed.

**Bernardine Monks** (bėr'nar-din), a name given in France to the Cistercians, after St. Bernard. See *Cistercians*.

**Bernardo Del Carpio** (bėr-nar'dō), a half legendary Spanish hero of the ninth century, son of Ximena, sister of Alphonso the Chaste, by Don Sancho of Saldaña. Alphonso put out the eyes of Don Sancho and imprisoned him, but spared Bernardo, who distinguished himself in the Moorish wars, and finally succeeded in obtaining from Alphonso the Great the promise that his father should be given up to him. At the appointed time his father's corpse was sent to him and Bernardo in disgust quitted Spain for France, where he spent the remainder of his life as a knight errant.

**Bernard of Morlaix,** a monk of the abbey of Cluny under Peter the Venerable (1122–56). He wrote a Latin poem on *Contempt of the World* in about 3000 leonine dactylic verses, from which are taken the popular hymns, *Jerusalem the Golden*, *Brief Life is here our Portion*, etc.

**Bernard of Treviso,** a noted Italian alchemist, born at Padua 1406; died 1490. His most important work was *Tractatus de secretissimo philosophorum opere chemico*, 1600.

**Bernauer** (ber'nou-ėr), AGNES, the daughter of an Augsburg baker or barber, whom Albert, only son of the reigning Duke of Bavaria, secretly married. Not knowing that the union was a lawful one, Duke Ernest urged his son to marry. Albert thereupon confessed that Agnes was his lawful spouse, which so incensed the duke that, during his son's absence, he had Agnes seized and condemned to death on a charge of sorcery. She was drowned in the Danube near Straubing, where her remains were subsequently interred by Albert. Her story forms the subject of works by Törring, Körner, Böttger, Hebbel and Meyr.

**Bernay** (ber-nā), a town of France, dep. of Eure, on the Charentonne, with some manufactures and a horse-fair, held in the fifth week in Lent, one of the largest in France. Pop. 5973.

**Bernburg** (bern'burh), a town of Germany, duchy of Anhalt, on both sides of the Saale, divided into the old, the new, and the high town; the first two communicating by a bridge with the latter. It contains an oil-mill, breweries, distilleries; and manufactures paper, earthenware, copper and tin wares, etc. Pop. 34,929.

**Berne.** See *Bern.*

**Berners,** JOHN BOURCHIER, LORD, an English statesman and writer, born about 1469. He became chancellor of the exchequer in 1515, and was for many years governor of Calais; died in 1532. He translated Froissart's *Chronicles*, 1523–25, and other works, his translation of the former being a sort of English classic.

**Berners,** or BARNES, JULIANA, LADY, an English writer of the fifteenth century, of whom little more is known than that she was prioress of the nunnery of Sopwell, near St. Alban's. The book attributed to her is entitled in the edition of Wynkyn de Worde (1496), *Treatyse perteynynge to Hawkynge, Huntynge and Fysshynge with an angle; also a right noble Treatyse on the Lygnage of Cot Armours*, etc. The treatises on fishing and on coat-armour did not appear in the first St. Alban's edition of 1481. It was for a long time the popular sporting manual.

**Bernese Alps,** the portion of the Alps which forms the northern side of the Rhone Valley, and extends from the Lake of Geneva to that of Brienz, comprising the Finsteraarhorn, Schreckhorn, Jungfrau, Monk, etc.

**Bernhard** (bern'härt), Duke of Saxe-Weimar, general in the Thirty Years' war, born in 1604, the fourth son of Duke John of Saxe-Weimar, entered the service of Holland, and afterwards the Danish army employed in Holstein. He then joined Gustavus Adolphus, and in the battle of Lützen, 1632, commanded the victorious left wing of the Swedish army. In 1633 he took Bamberg and other places, was made Duke of Franconia, and after the alliance of France with Sweden raised an army on the Rhine to act against Austria. After many brilliant exploits he captured Breisach and other places of inferior importance, but showed no disposition to hand them over to the French, who began to find their ally undesirably formidable. He rejected a proposal that he should marry Richelieu's niece, the Duchess d'Aiguillon, seeking instead the hand of the Princess of Rohan. This the French court refused lest the party of the Huguenots should become too powerful. He died somewhat suddenly in 1639 at Neuberg, the common opinion being that he was poisoned by Richelieu.

**Bernhardi** (bern-här'di), GENERAL FRIEDRICH A. J. VON, a German soldier and military expert, born in 1849; served in the cavalry. He is commonly believed to represent the German militarist of the most influential type, and his books have figured prominently in discussions of German militarism. *Germany and the Next War* in which he expounded many of the theories put into practice in the European War, has had a wide circulation in America.

**Bernhardt** (bern'härt), SARAH, (ROSINE BERNARD), a distinguished French actress, born at Paris in 1845; of Jewish descent, and of mixed French and Dutch parentage. In 1858 she entered the Paris Conservatoire and gained prizes for tragedy and comedy in 1861 and 1862; but her début at the Théâtre Française in *Iphigénie* was not a success. After a brief retirement she reappeared at the Gymnase and the Porte Saint-Martin in burlesque, and in 1867 at the Odéon in higher drama. Her success in Hugo's *Ruy Blas* led to her being recalled to the Théâtre Français, after which she abundantly proved her dramatic genius. In 1882 she married M. Damala, a Greek. Her tours both in Europe and America never failed to be successful, despite a marked degree of eccentricity. She has exhibited as a sculptor at the Salon, and has written her autobiography.

**Berni** (bĕr'nē), FRANÇESCO, an Italian burlesque poet of the sixteenth century, born about 1498 in Tuscany. He took orders, and about 1530 became a canon of the Florence Cathedral, where he lived till his death in 1536. A vague story asserts that Berni, who was intimate with both Alessandro de' Medici and Ippolito de' Medici, was requested by each to poison the other, and that on his refusal he was poisoned himself by Alessandro. He takes the first place among the Italian comic poets. He wrote good Latin verses, and his rifacimento of Boiardo's *Orlando Innamorato* is an admirable work of its class.—Another Berni (COUNT FRANCESCO BERNI, who was born in 1610 and died in 1673) wrote eleven dramas and a number of lyrics.

**Bernicia** (ber-ni'shi-a), an ancient Anglican kingdom stretching from the Firth of Forth to the Tees, and extending inland to the borders of Strathclyde. It was united with Deira, and became part of the Kingdom of Northumbria.

**Bernicle Goose.** See *Barnacle Goose.*

**Bernier** (bern-yā), FRANÇOIS, a French physician and traveler, born at Angers about 1625; set out on his travels in 1654, and visited Egypt, Palestine, and India, where he remained for twelve years as physician to the Great Mogul emperor Aurungzebe. After his return to France he published his

*Travels*, an abridgement of the *Philosophy of Gassendi*, a *Treatise on Freedom and Will*, and other works. He died at Paris in 1688.

**Bernina** (ber-nē'nâ), a mountain in the Rhætian Alps, 13,000 feet high, with the large Morteratsch Glacier. The Bernina Pass on the west of the mountain is 7695 feet in height.

**Bernini** (ber-nē'nē), GIOVANNI LORENZO, an Italian painter, sculptor, and architect, born in 1598. His marble group, *Apollo and Daphne*, secured him fame at the age of eighteen and he was employed by Urban VIII to prepare plans for the embellishment of the Basilica of St. Peter's. His architectural designs, including the great colonnade of St. Peter's, perhaps brought him his greatest celebrity. In 1663 he accepted the invitation of Louis XIV to visit Paris, traveling thither in princely state and with a numerous retinue.

**Bernis** (ber-nē), FRANÇOIS JOACHIM DE PIERRE DE, cardinal and minister of Louis XV, born in 1715; died in 1794. Madame de Pompadour presented him to Louis XV, who assigned him an apartment in the Tuileries, with a pension of 1500 livres. After winning credit in an embassy to Venice he rose rapidly to the position of minister of foreign affairs, and is possibly to be credited with the formation of the alliance between France and Austria which terminated the Seven Years' War. The misfortunes of France being ascribed to him, he was soon afterwards banished from court, but was made Archbishop of Alby in 1764, and in 1769 ambassador to Rome, where he remained till his death. When the aunts of Louis XVI left France in 1791 they fled to him for refuge, and lived in his house. The revolution reduced him to a state of poverty, from which he was relieved by a pension from the Spanish court. His verse procured him a place in the French Academy. The correspondence of Bernis with Voltaire contains matter of interest.

**Bernissartia** (ber-ni-sär'ti-a), a genus of extinct Wealden crocodiles, the type of the family *Bernissartiidæ*, whose remains have been found in a quarry in Bernissart, Belgium.

**Bernoulli,** or BERNOULLI (ber-nō-ye), a family which produced eight distinguished men of science. The family fled from Antwerp during the Alva administration, going first to Frankfort, and afterwards to Basel.—1. JAMES, born at Basel in 1654, became professor of mathematics there 1687, and died 1705. He applied the differential calculus to difficult questions of geometry and mechanics; calculated the loxodromic and catenary curve, the logarithmic spirals, the evolutes of several curved lines, and discovered the so-called *numbers of Bernouilli*.—2. JOHN, born at Basel in 1667, wrote with his brother James a treatise on the differential calculus; developed the integral calculus, and discovered, independently of Leibnitz, the exponential calculus. After the death of his brother in 1705 he received the professorship of mathematics at Basel, which he held until his death in 1748.—3. NICHOLAS, nephew of the former, born at Basel in 1687; in 1705 went to Groningen to John Bernouilli, and returning with him to Basel, John becoming professor of mathematics. On the recommendation of Leibnitz he went as professor of mathematics to Padua in 1716, but returned to Basel in 1722 as professor of logic, and in 1731 became professor of Roman and feudal law. He died in 1759. The three following were sons of the above-mentioned John Bernouilli.—4. NICHOLAS, born at Basel 1695, became professor of law at Bern in 1723, and died in St. Petersburg in 1726.—5. DANIEL, born at Groningen 1700; studied medicine. At the age of twenty-five he went to St. Petersburg, returning in 1733 to Basel, where he became professor of natural philosophy. He retired in 1777, and died in 1782.—6. JOHN, born at Basel in 1710, went to St. Petersburg in 1732, became professor of rhetoric at Basel in 1743, and in 1748 professor of mathematics. He died in 1790. The two following were his sons:—7. JOHN, licentiate of law and royal astronomer in Berlin, born at Basel in 1744; died 1807.—8. JAMES, born at Basel in 1759; went to St. Petersburg, where he became professor of mathematics; died in 1789.

**Bernstein** (bèrn'stĭn), EDUARD, a German writer and Social-Democratic leader, born in Berlin in 1850; turned his attention to political writing in 1878; served in the Imperial Reichstag, 1902–06. His books have given rise to keen discussion in the German Socialist party.

**Bernstein,** FRAU (ELSA PORGES), a German writer of plays, born at Vienna in 1866. Her *Königskinder* was used by Humperdinck as the basis of one of his operas. She also wrote *Dämmerung*, *Mutter Maria*, *Achilles* (1910), etc.

**Bernstorff,** the name of a German noble family, its most distinguished member being JOHANN HARTWIG ERNST, Count von Bernstorff, Danish statesman under Frederick V and Christian VII, born in Hanover in 1712. He was the most influential member of the government, which distinguished itself under his direction by a wise neutrality

during the Seven Years' war, etc., by measures for improving the condition of the Danish peasantry; by promoting science, and sending to Asia the expedition which Niebuhr accompanied. By his efforts Denmark acquired Holstein. He died in 1772.

**Beroe** (ber'o-ē), a genus of small marine, cœlenterate animals, order Ctenophora, transparent and gelatinous, globular in form, floating in the sea, and shining at night with phosphoric light.

**Berosus** (be-rō'sus), a priest of the temple of Belus at Babylon early in the third century B.C., who wrote in Greek a history of the Babylonian Chaldeans, founded on the ancient archives of the temple of Belus. It is known only by the quotations from it in Eusebius, Josephus, etc.

**Berquin** (ber-kan), ARNAUD, a French writer, born in 1749. He first attracted notice by his *Idylles*, and by several translations entitled *Tableaux Anglais;* but was best known by his *Ami des Enfants*, a series of narratives for children, for which, though plagiarized from Weiss's *Kinderfreund*, he received the prize of the French Academy in 1789. He was for some time the editor of the *Moniteur*. He died in 1791.

**Berri,** or BERRY (ber'ri, Fr. pron. bā-rē'), formerly a province and dukedom, with Bourges as capital, almost in the center of France. It is now mainly comprised in the departments Indre and Cher.

**Berri,** or BERRY (bā-rē), CHARLES FERDINAND, DUKE OF, second son of the Count d'Artois (afterwards Charles X), born at Versailles in 1778. In 1792 he fled with his father to Turin and served under him and Condé on the Rhine. In 1801 he came to Britain, where he lived alternately in London and Scotland, occupied with plans for the restoration of the Bourbons. In 1814 he landed at Cherbourg, and passed on to Paris, gaining many adherents to the royal cause; but they melted away when Napoleon landed from Elba, and the count was compelled to retire with the household troops to Ghent and Alost. After the battle of Waterloo he returned to Paris, and in 1816 married. He was assassinated by Louvel, a political fanatic, on Feb. 14, 1820. The duke had by his wife, Carolina Ferdinanda Louisa, eldest daughter of Francis, afterwards King of the Two Sicilies, a daughter, Louise Marie Thérèse, afterwards Duchess of Parma, and a posthumous son subsequently known as Comte de Chambord.

**Berry,** SIR EDWARD, a British admiral, born 1766; died 1831. He served with Nelson in 1796 and was flag captain to Nelson at the battle of the Nile. He commanded the *Agamemnon* in the battles of Trafalgar and San Domingo. In 1821 he attained the rank of rear-admiral.

**Berry,** MARY, an English author, born in 1763; died in 1852. She is known chiefly for her association with Horace Walpole, whose works she edited (1798). Among other works she published *England and France:* a Comparative View of the Social Condition of Both Countries.

**Berry** (ber'i), a succulent fruit, in which the seeds are immersed in a pulpy mass enclosed by a thin skin. The name is usually given to fruits in which the calyx is adherent to the ovary and the placentas are parietal, the seeds finally separating from the placenta and lying loose in the pulp. The term, however, is frequently used to include fruits in which the ovary is free and the placentas central, as the grape. Popularly it is applied to fruits like the strawberry, bearing external seeds on a pulpy receptacle, but not strictly berries.

**Berryer** (ber-yā), ANTOINE PIERRE, a French advocate and statesman, born in Paris 1790. He assisted his father in defense of Ney, secured the acquittal of General Cambronne, and defended Lamennais from a charge of atheism. His eloquence was compared with that of Mirabeau, and after the dethronement of Charles X (1830) he remained in the Chamber as the sole Legitimist orator. In 1840 he was one of the counsel for the defense of Louis Napoleon, after the Boulogne fiasco. In 1843 he did homage to the Comte de Chambord in London, adhering to him through the revolution of 1848, and voting for the deposition of the prince-president the morning after the *coup d'état*. He gained additional reputation in 1858 by his defense of Montalembert. In 1863 he was re-elected to the chamber with Thiers, and in 1864 received a flattering reception in England. He died in 1868.

**Bersaglieri** (ber-sâl-yā'rē), a corps of Italian sharpshooters organized early in the reign of Victor Emmanuel. Many of them are now mounted on bicycles, and form an important auxiliary to the light moving troops of the army.

**Berserker** (bêr-sêr'kir), a Scandinavian name for warriors who fought in a sort of frenzy or reckless fury, dashing themselves on the enemy in the most regardless manner. The first Berserker was said to have been Berserk, the grandson of the eight-handed Starkader and the fair Alfhilde. He wore no mail in battle, and had twelve

sons, also called *Berserker*. The name is probably derived from the bear-sark or bear-skin shirt worn by early warriors.

**Bert,** PAUL, physiologist, born at Auxerre, France, in 1833; died in 1886. He studied law and medicine, was Claude Bernard's ablest pupil. He was professor of natural sciences at Bordeaux in 1866, assistant professor of physiology at Paris, 1869. He was an enthusiastic teacher, and served as minister of public instruction 1881–82, vigorously opposing the religious element in education. He was the author of a number of scientific works, among them *La Pression barométrique*.

**Berthelot** (bert-lō), MARCELLIN PIERRE EUGÈNE, a noted chemist, born in Paris in 1827; died in 1907. Made professor of organic chemistry in the College of France in 1864, he won distinction by the synthesis of various organic compounds. He was elected perpetual secretary of the Academy of Science in 1889, held several cabinet positions in the French government, and was elected to the French Academy in 1900.

**Berthier** (bert-yā), ALEXANDRE, prince of Neufchâtel and Wagram, marshal, vice-constable of France, etc.; born 1753; son of a distinguished officer. While yet young he served in America with Lafayette, and after some years' service in France he joined the army of Italy in 1795 as general of division and chief of the general staff, receiving in 1798 the chief command. In this capacity he entered Rome. He followed Bonaparte to Egypt as chief of the general staff; was appointed by him minister of war after the 18th Brumaire; accompanied him to Italy in 1800, and again in 1805, to be present at his coronation; and was appointed chief of the general staff of the grand army in Germany. In all Napoleon's expeditions he was one of his closest companions, on several occasions rendering valuable services, as at Wagram in 1809, which brought him the title of *Prince of Wagram*. After Napoleon's abdication he was taken into the favor and confidence of Louis XVIII, and on Napoleon's return the difficulty of his position unhinged his mind, and he put an end to his life by throwing himself from a window. He left a son, Alexander (born in 1810), one of the most zealous adherents of Napoleon III.

**Berthollet** (ber-to-lā), CLAUDE LOUIS, COUNT, an eminent French chemist, born in 1748; studied medicine; became connected with Lavoisier; was admitted in 1780 member of the Academy of Sciences at Paris; in 1794 professor in the normal school there. He followed Bonaparte to Egypt, and returned with him in 1799. Notwithstanding the various honors conferred on him by Napoleon he voted in 1814 for his dethronement, and was made a peer by Louis XVIII. His chief chemical discoveries were connected with the analysis of ammonia, the use of chlorine in bleaching, the artificial production of niter, etc. His most important works were his *Essai de Statique Chimique* (1803), and the *Méthode de Nomenclature Chimique* (1787). He died at Paris in 1822.

**Bertholletia** (ber-to-lā'sha), name given in honor of Berthollet to a genus of plants of the family *Lecythidaceæ*, consisting of two species, *B. excelsa* and *B. nobilis*. They form vast forests on the banks of the Amazon, Rio Negro, and Orinoco, the trees averaging 100 feet in height. The *B. excelsa* produces the well-known Brazil-nuts of commerce, which are contained in a round and strong seed-vessel, to the number of from fifteen to fifty or more, and contain a great deal of oil.

**Berthon,** EDWARD LYON, English clergyman and inventor, born 1813; died 1899. He experimented with the screw-propeller, invented a marine speed indicator, known as 'Berthon's log,' but is chiefly noted as the inventor of 'Berthon's folding boat,' which was adopted by the British admiralty in 1874, and is now in almost universal use.

**Bertillon System** (ber-til-lon), a method devised for the identification of criminals by Dr. Alphonse Bertillon, of Paris, in 1885. Formerly photographs and descriptions were depended upon, but he inaugurated a system of exact measurements of various parts of the body, head and limbs, which cannot well be duplicated in any two individuals. The print of the thumb, with its series of regular skin lines, is one of these means of identification, the prints differing for each individual.

**Bertold von Regensburg,** the greatest German preacher of the middle ages, was born about 1220, at Regensburg, and entered the Franciscan monastery there. By the time he was thirty his fame as a preacher had spread over all the German-speaking parts of Europe. In his sermons he did much to hasten the decline of Middle High German poetry by his condemnation of the elegant world of chivalry. Died 1272.

**Bertrand,** HENRI GRATIEN, COMTE, French general and companion of Napoleon at St. Helena, was born at Châteauroux, France, in 1773; died there in 1844. He served with distinction in Napoleon's Austrian campaign,

at Wagram, in Russia and at Waterloo. At Leipsic he is credited with having saved the French army from annihilation. In 1840 he was chosen by the French nation to bring Napoleon's remains to France. A posthumous work, *Les campagnes d'Egypte et de Syrie, mémories pour servir à l'histoire de Napoléon, dictés par lui-même, à Sainte-Hélène, au general Bertrand*, was published in 1847.

**Berwick** (ber'ik), or more fully, BERWICK-ON-TWEED, a seaport town of England, formerly a parl. bor. and a county by itself, but now incorporated with Northumberland, and giving name to a parl. div. of the county. It stands on the north or Scottish side of the Tweed, within half a mile of its mouth. It is surrounded by walls of earth faced with stone. The Tweed is crossed by an old bridge and by a fine railway viaduct, these connecting it with its suburbs Tweedmouth and Spittal, the latter a favorite watering-place. Chief industries: iron manufactures, agricultural implements, etc. Pop. 13,075.—The county of Berwick, the most eastern border-county of Scotland. Total area, 464 sq. miles, of which two-thirds are productive. The principal rivers are the Tweed and the Eye. The county is in high repute for agriculture, but has few manufactures. Pop. of county, 30,800.

**Berwick,** a borough of Columbia County, Pa. Flour and planing-mills, manufactories of pipe and pottery, and iron works are its principal industries. Pop. (1910) 5357.

**Berwick,** JAMES FITZ-JAMES, DUKE OF, natural son of the Duke of York (afterwards James II) and Arabella Churchill, sister of Marlborough, was born at Moulins, in the Bourbonnais in 1670, and first went by the name of Fitz-James. He received his education in France, served in Hungary, returned to England at the age of seventeen, and received from his father the title of duke. On the landing of the Prince of Orange he went to France with his father, and he was wounded at the battle of the Boyne, where he nominally commanded. He afterwards served under Luxembourg in Flanders; in 1702 and 1703 under the Duke of Burgundy; then under Marshal Villeroi. In 1706 he was made marshal of France, and sent to Spain, where he gained the battle of Almanza, which rendered Philip V again master of Valencia. He was killed by a cannon-ball at the siege of Philipsburg in 1734.

**Berwyn,** a city of Cook County, Ill., incorporated in 1902. Pop. (1910) 5357.

**Beryl,** a colorless, yellowish, bluish, or less brilliant green variety of emerald, the prevailing hue being green of various shades, but always pale, the want of color being due to absence of chromium, which gives to the emerald its deep rich green. Its crystals, which are six-sided, are usually longer and larger than those of the precious emerald, and its structure more distinctly foliated. The best beryls are found in Brazil, in Siberia, and Ceylon, and in Dauria, on the frontiers of China. Beryls are also found in many parts of the United States. Some of the finer and transparent varieties of it are often called *aquamarine.*

**Beryllium** (ber-il'yum), a metal occurring in beryl and other minerals of a color similar to zinc. Specific gravity 1.64; malleable; does not oxidize in air or water. Atomic weight 9.4; symbol Be.

**Berzelius** (ber-zē'li-us), JÖNS JAKOB, BARON, a Swedish chemist, born in 1779; studied medicine at Upsala, and after holding one or two medical appointments was appointed lecturer in chemistry in the Stockholm military academy in 1806, and the following year professor of pharmacy and medicine. In 1808 he became a member of the Academy of Sciences at Stockholm, in 1810 director, and in 1818 its perpetual secretary. In 1818 the king made him a noble, and in 1835 a baron. He discovered selenium and thorium, first exhibited calcium, barium, strontium, tantalum, silicium, and zirconium in the elemental state, and investigated whole classes of compounds, as those of fluoric acid, the metals in the ores of platinum, tantalum, molybdenum, vanadium, sulphur salts, etc., and introduced a new nomenclature and classification of chemical compounds. In short, there was no branch of chemistry to which he did not render essential service. His writings comprise an important *Text-book of Chemistry, View of the Composition of Animal Fluids, New System of Mineralogy, Essay on the Theory of Chemical Proportions*, etc. He died in 1848.

**Bes,** the Egyptian god of recreation, represented clad in the skin of an animal, with large head, goggle eyes, sloggy beard, and with a dwarfish and altogether grotesque appearance.

**Besançon** (bē-sàṇ-sōṇ), a town of Eastern France, capital of the department Doubs, is situated on a rocky peninsula washed on three sides by the river Doubs, and surmounted by a strong citadel. It is the birthplace of Victor Hugo, to whom a statue was erected in the town. The streets are spacious and well laid out, with fine cathedral and churches, public buildings and prom-

enades. The manufactures comprise linen, cotton, woolen, and silk goods, ironmongery, etc.; but the principal industry is watchmaking, which employs about 13,000 persons. Besançon is the ancient *Vesontio*, *Besontium* or *Bisontium*, described by Cæsar. In the fifth century it came into possession of the Burgundians; in the twelfth passed with Franche-Comté to the German Empire. In 1679 it was ceded to France along with the rest of Franche-Comté, of which it remained the capital till 1793, with a parliament, etc., of its own. Pop. 41,760.

**Besant** (be-zant'), ANNIE, theosophist, born at London in 1847. Radical in view, she joined the National Secular Society in 1874, worked in the Free Thought movement of Charles Bradlaugh, became an ardent Socialist, and in 1889 joined the Theosophical Society, eventually succeeding Madame Blavatsky as its head.

**Besant,** SIR WALTER, an English novelist, born in 1836, educated in London and at Christ College, Cambridge, where he graduated with mathematical honors. He was for a time professor in the Royal College, Mauritius. He was long secretary to the Palestine Exploration Fund, and published a *History of Jerusalem* in connection with Prof. Palmer. He is best known by his novels, a number of which were written in partnership with James Rice, including *Ready-Money Mortiboy; This Son of Vulcan; The Case of Mr. Lucraft; The Golden Butterfly; The Monks of Thelema;* etc. After Rice's death (1882), he produced *All Sorts and Conditions of Men; All in a Garden Fair; Dorothy Forster; The World Went very Well Then;* etc. He undertook a series of important historical and archæological volumes, dealing with the associations and development of the various districts of London, and produced *A Survey of London* (left unfinished); *London* (1892); *Westminster* (1895); and *South London* (1899). He died June 9, 1901.

**Bessarabia** (bes-sa-rā'bi-a), a Russian province stretching in a northwesterly direction from the Black Sea, between the Pruth and Danube and the Dniester. It was conquered by the Turks in 1503, taken by the Russians in 1770, ceded to them by peace of Bucharest in 1812; the S. E. extremity was given to Moldavia in 1856; but restored to Russia by treaty of Berlin in 1878. In the north the country is hilly, but in the south flat and low. It is fertile in grain, but is largely used for pasturage. Wine making is a profitable industry. Capital, Kishenef; area, 17,614 sq. miles. Pop. about 2,500,000.

**Bessarion** (bes-sā'ri-on), JOHANNES, titular patriarch of Constantinople and Greek scholar, born in Trebizond 1389 or 1395; died in 1472. He was made Archbishop of Nicæa by John VII Palæologus, whose efforts to unite the Greek and Roman churches he seconded in such a way as to lose the esteem of his countrymen and gain that of Pope Eugenius IV, who made him cardinal. He held various important posts, and was twice nearly elected pope. The revival of letters in the fifteenth century owed not a little to his influence. He left translations of Aristotle and vindications of Plato, with valuable collections of books and MSS.

**Besseges** (bā-sāzh), a town of Southern France, department of Gard, with important coal and iron mines and blast-furnaces. Pop. 7662.

**Bessel,** FRIEDRICH WILHELM, a German astronomer, born in 1784; appointed in 1810 director of the observatory at Königsberg. He called attention to the probable existence of a planetary mass beyond Uranus, thus resulting in the discovery of Neptune. In pure mathematics he enlarged the resources of analysis by the invention of Bessel's Functions. He died in 1846. His principal works are the *Fundamenta Astronomiæ* (1818), and its continuation, the *Tabulæ Regiomontanæ* (1830) and *Astronomical Researches* (1841–42). His determination of the parallax of the star 61 Cygni was one of his most noteworthy practical achievements. Modern astronomy of precision owes much to his labors.

**Bessemer** (bes'se-mer), a manufacturing city of Jefferson County, Alabama, 11 miles S. W. of Birmingham, of recent origin, named after the inventor, situated in the center of coal and iron fields, and with numerous blast-furnaces and other iron-working industries. Pop. 10,864.

**Bessemer,** SIR HENRY, an English engineer and inventor, was born in Hertfordshire in 1813. He became celebrated for his process of rapidly making steel from pig-iron by blowing a blast of air through it when in a state of fusion, so as to clear it of all carbon, and then adding just the requisite quantity of carbon to produce steel—a process which has introduced a revolution in the steel-making trade, cheap steel being now made in vast quantities and used for many purposes in which its price formerly prohibited its application. He was knighted in 1879. Died March 15, 1898.

**Bestiaries** (bes'ti-ār-rēz), a name given to a class of books

very popular in the eleventh, twelfth, and thirteenth centuries, describing all sorts of animals, real and fabled, and forming a species of medieval encyclopedia of zoology. The animals were treated as symbolic, and their peculiarities or supposed peculiarities spiritually applied. The volumes are to be found both in Latin and in the vernacular, in prose and in verse.

**Beta.** See *Beet.*

**Betanzos** (be-tán'thōs), a town of Northern Spain, 10 miles S. E. of Coruña. Pop. 8948.

**Bet'el,** BET'LE a species of pepper, *Chavïca betel,* a creeping or climbing plant, native of the East Indies, nat. order *Piperaceæ.* The leaves are employed to inclose a piece of the areca or betel-nut and a little lime into a pellet, which is extensively chewed in the East. The pellet is hot and acrid, but has aromatic and astringent properties. It tinges the saliva, gums and lips a brick-red, and blackens the teeth.

**Betel-nut,** the kernel of the fruit of the beautiful palm *Arëca catĕchu,* found in India and the East,

**Leaf, Flowers, and nut of Betel Palm (*Areca catechu*).**

and named from being chewed along with betel-leaf. (See preceding art.) When ripe it is of the size of a cherry, conical in shape, brown externally, and mottled internally like a nutmeg. Ceylon alone exports many tons annually.

**Bethany** (beth'a-nē), now called *El' Azariyeh,* a village of Palestine, on the eastern slope of Mount Olivet, about 2 miles E. of Jerusalem, formerly the home of Martha, Mary and Lazarus, near which the ascension of Christ is said to have taken place.

**Bethesda** (be-thes'da; 'house of mercy'), a pool in Jerusalem near St. Stephen's Gate and the Temple of Omar. It is one of the sites suggested for the pool mentioned in John V: 2-9. Now known as Birket Isra'il.

**Bethlehem** (beth'lē-hem), the birthplace of Christ; a village, formerly a town, in Palestine, a few miles south from Jerusalem. Pop. about 8000, chiefly Christians, who make rosaries, crucifixes, etc., for pilgrims. There are three convents for Catholics, Greeks, and Armenians. A richly adorned grotto lighted with silver and crystal lamps, under the choir of the fine church built by Constantine, is shown as the actual spot where Jesus was born.

**Bethlehem,** a town of Pennsylvania, founded by Moravians in 1741 on the Lehigh River across which is a bridge connecting it with South Bethlehem, the seat of Lehigh University. It has silk and knitting mills, etc., and in South Bethlehem are extensive iron and steel plants. Population, 15,000.

**Bethlehemites** (beth'le-hem-īts), a name applied (1) to the followers of John Huss, from Bethlehem Church, Prague, where he preached; (2) to an order of monks established according to Matthew Paris in 1257, with a monastery at Cambridge; (3) to a community founded in Guatemala about 1655 by Pedro Betancourt, and raised to an order by Innocent XI in 1687. It spread to Mexico, Peru, and the Canary Islands. An order of nuns founded in 1667 bore the same name.

**Bethlen-Gabor** (bet'len-gä'bor), that is, *Gabriel-Bethlen,* born of a Protestant Magyar family in 1580; fought under Gabriel Bathori, and then joined the Turks, by whose aid he made himself Prince of Transylvania in 1613. In 1619 he assisted the Bohemians against Austria, and, marching into Hungary, was elected king by the nobles (1620). This title he surrendered in return for the cession to him by the Emperor Ferdinand of seven Hungarian counties and three fortified places. After a brilliant reign he died in 1629 without heir.

**Bethmann-Hollweg** (bet'män-hol'veg), THEOBALD VON, German statesman, born in 1856. He succeeded von Bulow as chancellor in 1909, retaining office till July, 1917.

**Bethnal Green,** an eastern suburban district and parish of London, Middlesex, now forming a parl. bor. having two divisions with two members. Here is the Bethnal Green Museum. Pop. 128,282.

**Béthune** (bā-tün), an old town of France, dep. of Pas de Calais, with various industries and a considerable trade. Pop. 11,370.

**Bethune** (bē-thön'), THOMAS G., an American negro musical prodigy, better known as 'Blind Tom.' He was born about 1850, near Columbus, Ga., of slave parents. Though blind and half-witted from birth he early evinced great musical talents, and could play on the piano the most complicated and difficult composition after hearing it once performed. Died 1908.

**Betlis,** or BITLIS, a town of Turkish Armenia. Pop. (Turks, Kurds, and Armenians), about 25,000.

**Betony,** the popular name of *Stachys betonica* (or *Betonica officinalis*), a libiate plant with purple flowers which grows in woods, was formerly much employed in medicine, and sometimes used to dye wool of a fine dark-yellow color.—*Water betony, Scrophularia aquatica,* is named from the resemblance of its leaf to that of betony.

**Betrothment** (be-troth'ment), a mutual promise or contract between two parties, by which they bind themselves to marry. It was anciently attended with the interchange of rings, joining hands, and kissing in presence of witnesses; and formal betrothment is still the custom on the continent of Europe, being either solemn (made in the face of the church) or private (made before witnesses out of the church). As betrotbments are contracts, they are valid only between persons whose capacity is recognized by law, and the breach of them may be the subject of litigation.

**Betterton** (bet'ter-ton), THOMAS, an English actor in the reign of Charles II, born in 1635; excelled in Shakespere's characters of Hamlet, Othello, Brutus, and Hotspur, and was the means of introducing shifting scenes instead of tapestry upon the English stage. He died in 1710, and was buried in Westminster Abbey. He wrote a number of plays and the book of an opera. Mrs. Sanderson, whom he married in 1662, was also an actress of repute.

**Bet'ting,** the staking or pledging of money or property upon a contingency or issue. The processes of betting may be best illustrated in connection with horse-racing, which furnishes the members of the betting fraternity with their best markets. Bettors are divided into two classes—the backers of horses, and the bookmakers, or professional bettors, who form the *betting ring,* and make a living by betting against horses according to a methodical plan. By the method adopted by the professional bettor the element of chance is as far as possible removed from his transactions, so that he can calculate with a reasonable prospect of having his calculations verified, on making more or less profit as the result of a season's engagements. Instead of backing any particular horse, the professional bettor lays the same sum against every horse that takes the field, or a certain number of them, and in doing so he has usually to give odds, which are greater or less according to the estimate formed of the chance of success which each of the horses has on which the odds are given. Very frequently the receipts of the bookmaker are augmented by sums paid on account of horses which have been backed and never run at all. Sometimes, although not often, the odds are given upon and not against a particular horse. Books may also be made up on the principle of betting against any particular horse getting a place among the first three. The odds in this case are usually one-fourth of the odds given against the same horse winning. Another mode of betting is that called a sweepstake, in which a number of persons join in contributing a certain stake, after which each of those taking part in the sweepstake has a horse assigned to him (usually by lot), which he backs and the backer of the winning horse gains the whole stakes. If there are more persons taking part in the sweepstake than there are horses running some of them must draw blanks, in which case of course their stakes are at once lost. In the years immediately preceding 1850 the practice of betting had increased to such an extent in England that an act for the suppression of betting-houses was passed, though it cannot be said to have been very effective. Similar legal restrictions are nominally operative in France and the United States.

**Bet'tong.** See *Kangaroo Rat.*

**Betula** (bet'u-la), the birch genus, type of the order *Betulaceæ,* which belongs to the amentaceous plants, and consists of trees or shrubs with serrate, deciduous leaves, flowers in catkins, scales in place of perianth; genera *Betula* and *Alnus* (alder).

**Betwa** (bet'wä), a river of India rising in the Vindhya range in Bhopal, and after a northeasterly course of 360 miles joining the Jumna at Hamirpur.

**Beust** (boist), FRIEDRICH FERDINAND, COUNT VON, Saxon and Austrian statesman, was born at Dresden in 1809; died in 1886. He adopted the career of diplomacy, and as member of embassies or ambassador for Saxony resided at Berlin, Paris, Munich, and Lon-

don. He was successively minister of foreign affairs and of the interior for Saxony. At the London conference regarding the Schleswig-Holstein difficulty he represented the German Bund. He lent his influence on the side of Austria against Prussia before the war of 1866, after which, finding his position in Saxony difficult, he entered the service of Austria as minister of foreign affairs, became president of the ministry, imperial chancellor, and in 1868 was created count. In 1871–78 he was ambassador in London, in 1878–82 in Paris.

**Beuthen** (boi'tn), a town in Prussian Silesia near the S. E. frontier, in the government of Oppeln; the center of a mining district. Manufactures of cloth and linens. Pop. 67,709.

**Beveland** (bā've-lânt), NORTH and SOUTH, two islands in the estuary of the Scheldt, Netherlands, province of Zeeland; aggregate area estimated 120 sq. miles. South Beveland is very fertile, and has manufactures of salt, leather, beer, etc.

**Beveridge** (bev'er-ij), ALBERT J., legislator, born in Ohio in 1862. His family removed to Illinois after the Civil war, and he graduated at De Pauw University in 1885, and was afterwards admitted to the bar. A fluent and popular political orator, he was elected to the United States Senate from Indiana in 1899 and re-elected in 1905. He wrote *The Russian Advance* and *The Young Man and the World*.

**Beveridge,** JOHN L., soldier and governor, born in New York in 1824. He removed to the West in 1842, was a lawyer in Chicago after 1855, and served in the army throughout the Civil war, attaining the rank of brigadier-general. He was elected lieutenant-governor of Illinois in 1872 and governor in 1873. Died 1910.

**Beveridge,** KÜHNE, American sculptor, granddaughter of John L. Beveridge, born in 1877. Was a pupil of Rodin. Exhibited at New York, London, and at Paris where at the Paris Exposition in 1900 she obtained honorable mention.

**Beveridge,** WILLIAM, an English divine, born in 1637, was, after various ecclesiastical preferments, appointed Bishop of St. Asaph in 1704. He died at Westminster in 1708.

**Beverley,** a town of England, E. riding of Yorkshire, 10 miles N. N. W. of Hull, and 1 mile from the river Hull, with which it has canal connection; has a fine Gothic minster, in some respects unsurpassed. Pop. 13,654.

**Beverley,** JOHN OF, an English prelate and saint, born about the middle of the seventh century at Harpham, Yorkshire; appointed Abbot of St. Hilda; afterwards Bishop of Hexham in 685; and promoted to the bishopric of York in 705. He founded a college for secular priests at Beverley, where he retired in 717, and died in 721. Many cases of miraculous healing were attributed to him.

**Beverley,** ROBERT, American colonial historian, born in Virginia in 1675. While assistant in charge of the Virginia colonial records, he wrote a *History of Virginia*, the first of its kind by a native Virginian, and valuable to-day as a historical work dealing with the Indians and contemporary affairs.

**Beverly,** a seaport of Essex Co., Massachusetts, 18 miles northeast of Boston; has a fine harbor and good fisheries. It is a summer resort, and has manufactures of shoes and shoe machinery, oiled clothing, belting, etc. In 1788 there was established here the first cotton mill to be successfully operated in the United States. It was the birthplace and early home of Lucy Larcom (1826–1893) and the scene of much of her *Story of a New England Girlhood*. Pop. 18,650.

**Beverwijk** a town in the province of North Holland, Netherlands, 8 miles N. of Haarlem. Pop. (1910) 6614.

**Bevis of Hampton,** the name of a medieval English metrical romance, is the story of the adventures of Bevis, son of Guy, earl of Hamtoun. The oldest extant version is an Anglo-Saxon text dating from the first half of the 13th century. In its various versions the story bears a close relation to the Hamlet legend as related by Saxo Grammaticus.

**Bewick** (bū'ik), THOMAS, a celebrated English wood engraver, born in Northumberland in 1753. He was apprenticed to Beilby, an engraver in Newcastle, and executed the woodcuts for Hutton's *Mensuration* so admirably that his master advised him to turn his attention to wood-engraving. With this view he proceeded to London, returning to Newcastle he entered into partnership with Beilby. He quite established his fame by the issue in 1790 of his *History of Quadrupeds* (text compiled by Beilby), the illustrations of which were superior to anything hitherto produced in the art of wood-engraving. In 1797 appeared the first and in 1804 the second volume of his *British Birds*, generally regarded as the finest of his works (text partly by Bewick). He died in 1828.

**Bex** (bā), a village of Switzerland, canton Vaud, with salt works and warm sulphur baths now much frequented. Pop. 4600.

**Bexhill,** municipal borough and watering place in Sussex, England. Pop. 12,213.

**Bexley,** town in parliamentary division of Dartford, Kent, England. It is mentioned in Domesday Book, and has had a church since the 9th century. Pop. 12,918.

**Bey.** See *Beg.*

**Beyle** (bāl), MARIE HENRI, a French author widely known by his pseudonym *de Stendhal;* born at Grenoble in 1783; held civil and military appointments under the empire; took part in the Russian campaign of 1812, thence until 1821 lived at Milan, chiefly occupied with works on music and painting. After nine years' residence at Paris he became consul at Civita Vecchia. In 1841 he returned to Paris, and died in 1842. The distinguishing feature of his works was the application of acutely analytic faculties to sentiment in all its varieties, his best books, *Le Rouge et le Noir,* 1831; and *La Chartreuse de Parme,* 1839.

**Beyrout** (bī-rōt'), or BEIRUT (ancient *Berytus*), the chief seaport of Syria, an ancient Phœnician city, 80 m. N. W. of Damascus; pop. estimated at 120,000 to 140,000, largely Christians. It stands on a tongue of land projecting into an open bay and backed by the Lebanon range, and has rapidly increased since 1835, mainly owing to the extension of the silk trade, of which it is the center. Its other chief exports are olive-oil, cereals, sesame, tobacco, and wool; manufactures are silk and cotton. The old town has narrow, dirty streets, very different from the new with its modern houses, hotels, churches, colleges and schools, gardens and carriage drives. It is intimately connected with the history of the Druses. It was bombarded and taken by the British in 1840.

**Beza** (properly, *de Bèze*), THEODORE, next to Calvin the most distinguished man in the early reformed church of Geneva; born of a noble family at Vezelay, Burgundy, 1519; educated in Orleans under Melchior Volmar, a German scholar devoted to the Reformation; in 1539 became a licentiate of law, and went to reside at Paris. His habits at this time were dissipated, and his *Poemata Juvenilia,* Latin verses of a more than Ovidian freedom, were afterwards a frequent ground of attack upon him. The reforming influence of a severe illness led in 1548 to his retirement to Geneva and his marriage with his mistress. In 1549 he became professor of Greek at Lausanne, occupying himself with the completion of Marot's translation of the Psalms and the study of the New Testament, and corresponding frequently with Calvin. In 1558 he was sent by the Swiss Calvinists on an embassy to obtain the intercession of the Protestant princes of Germany for the release of Huguenots imprisoned in Paris. In the following year he went to Geneva as a preacher, and soon after became a professor of theology, and the most active assistant of Calvin. He also rendered admirable service to the cause of the reformers at the court of the King of Navarre and in attendance upon Condé and Coligny. At Calvin's death in 1564 the administration of the Genevese Church fell entirely to his care. He presided in the synods of the French Calvinists at La Rochelle (1571) and at Nismes (1572); was sent by Condé (1574) to the court of the elector palatine; and at the religious conference at Montpellier (1586) opposed James Andreas and the theologians of Würtemberg. At the age of sixty-nine he married his second wife (1588), and in 1597 wrote a lively poetical refutation of the rumor that he had recanted and was dead. In 1600 he resigned his official functions, and he died in retirement in 1605. Among his many works, his *History of Calvinism in France from* 1521 *to* 1563, and *Theological Treatises,* are still esteemed; but he is most famous for his Latin translation of the New Testament.

**Bezant** (bez'ant, bē-zant'), originally a Byzantine gold coin, which had a wide circulation throughout Europe up to about 1250. Its average value was about $2. They are frequently employed as a heraldic charge, a custom supposed to have been introduced by the Crusaders.

**Bezdan,** town in Bacs-Bodrog, Hungary, on the Danube. Pop. 8000.

**Béziers** (bā-zyār; anc. *Beterræ*), a town in Southern France, dep. Hérault, beautifully situated on a height and surrounded by old walls, its chief edifices being the church of St. Nizaire, a Gothic structure dating from the 12th to the 14th centuries, crowning the height on which the town stands. Manufactures: woolens, hosiery, liqueurs, chemicals, etc., with a good trade in spirits, wool, grain, oil, verdigris, and fruits. It was an important place in the Roman period and in the Middle Ages, and in 1209 was the

scene of a horrible massacre of the Albigenses. Pop. (1906) 46,262.

**Bezique** (be-zēk'), a simple game of cards most commonly played by two persons with two packs. The now widely played game of pinochle is based upon and closely resembles it.

**Bezoar** (bē'zōr), a concretion or calculus, of a roundish or ovate form, met with in the stomach or intestines of certain animals, especially ruminants. Nine varieties of bezoars have been enumerated, broadly divisible into those which consist mainly of mineral and those which consist of organic matter. The true oriental bezoars, obtained from the gazelle, belong to the second class. They are formed by accretion round some foreign substance, a bit of wood, straw, hair, etc., and were formerly regarded as efficacious in preventing infection and the effects of poison.

**Bezwada** (bez-wä'da), town in British India, Madras Presidency. Pop. 24,224.

**Bhagalpur** (bhä-gal-pör'), a city in Bengal, capital of a district and division of the same name, on the right bank of the Ganges, here seven miles wide. It has remarkable Jain temples and is the seat of a large trade. There are several indigo works in the neighborhood. Pop. 75,760.—The division of Bhagalpur has an area of 19,776 sq. miles, and a pop. (chiefly Hindus, and Mohammedans) of 8,091,405.

**Bhamo** (b'hä-mō'), a town of Burmah on the Upper Irrawaddy, about 40 miles from the Chinese frontier. It is the starting-point of caravans to Yunnan, and is in position to become one of the great emporiums of the East in event of a regular overland trade being established between India and West China. Pop. (1901) 10,734, consisting of Chinese and Shans.

**Bhandara** (bhan-dä'ra), a town of India, Central Provinces, with manufactures of hardware and cottons. Pop. 14,023.

**Bhang.** See *Hashish.*

**Bhanpura** (bän-pō'rä), a walled town of Central India, in Indore state, on the Rewa, 60 miles s. of Kotah. Pop. 20,000.

**Bhartpur.** See *Bhurtpore.*

**Bhartrihari** (bar'tri-ha'ri), an Indian poet, reputed author of a book of apophthegms, according to legend a dissolute brother of King Vikramâditya (first century B. C.), who became a hermit and ascetic. The collection of 300 apophthegms bearing his name is, however, probably an anthology.

**Bhatgaon** (bhät-gä'on), a town of Nepal, about 8 miles from Khatmandu. Pop. about 30,000.

**Bhau Daji** (bou-dä'ji), an Indian physician and antiquarian, born in Manjare, Bombay, India, 1822. Graduating in medicine at the Grant Medical Colleges in 1850, he became assistant professor there. He carried on some valuable research work in the study of leprosy, and made a large collection of rare Sanskrit manuscripts; died 1874.

**Bhaunaghar** (bou-nug'ar), chief town and part of the state of the same name, Kathiawar peninsula, Bombay, India. Cotton is the chief export. Pop. (1901) 56,442. The area of the state is 2860 sq. miles, and it has a population of about half a million.

**Bhavabhuti** (bav-ä-bö'ti), a celebrated Indian dramatist of the 7th and 8th centuries. He wrote three plays, which have come down to us. The history of Rama forms the subject of the latter two.

**Bhavani-Kudal,** a town in Madras Presidency, India, 40 miles w. by s. of Salem; has famous temples erected to Vishnu and Siva. Pop. 10,000.

**Bheels,** or BHILS (bēls, bils), a Dravidic race inhabiting in scattered fashion a great part of India, a relic of the Indian aborigines driven from the plains by the Aryan Rajputs. They appear to have been orderly and industrious under the Delhi emperors; but on the transfer of the power in the eighteenth century from the Moguls to the Marathas they asserted their independence, and being treated as outlaws took to the hills. Various attempts to subdue them were made by the Gaekwar and by the British in 1818 without success. A body of them was, however, subsequently reclaimed, and a Bheel corps formed, which stormed the retreats of the rest of the race and reduced them to comparative order. The hill Bheels wear little clothing, and live precariously on grain, wild roots and fruits, vermin, etc., but the lowland Bheels are in many respects Hinduized. They number about one and a half million.

**Bhel.** See *Bel.*

**Bhera** (bē'ra), a town of British India, in the Shahpur district of the Punjab, situated on the river Jhelum. Pop. 18,680.

**Bhilsa,** BILSA (bil'sä), a town of India, in the state of Gwalior, on the right bank of the Betwa. It has a fort and well-built suburb, but is chiefly interesting on account of the Buddhist topes in the neighborhood, those at Sanchi

near Bhilsa being especially worthy of note.

**Bholan Pass.** See *Bolan Pass.*

**Bhooj.** See *Bhúj.*

**Bhopal** (bho-päl'), a native state of Central India under British protection, on the Nerbudda, in Malwah. Area 6902 sq. miles. The country is full of jungles, and is traversed by a part of the Vindhya Mts. The soil is fertile, yielding wheat, maize, millet, pease, and the other vegetable productions of Central India. Chief exports: sugar, tobacco, ginger, and cotton. The district is well watered by the Nerbudda, Betwa, and minor streams. Pop. 665,961.—The capital of above state, also called Bhopal, has a population of 76,561, and has an abundant water-supply in two fine artificial lakes near the town.

**Bhuj** (bhöj), chief town of Cutch in India, Bombay Presidency, at the base of a fortified hill, with military cantonments, high school and school of art, mausoleums of the Raos or chiefs of Cutch, etc. Pop. (1901) 26,362.

**Bhurtpore,** or BHARTPUR', a native state of India, in Rajputâna, bounded E. by Agra, S. and W. by the Rajput States. Area, 1961 sq. miles. The surface is generally low, and the state is scantily supplied with water; soil generally light and sandy; chief productions: corn, cotton, and sugar. The country is also known as Brij, and is the only Jât state of any size in India. Under British protection since 1826. Pop. 626,000.—The capital, which has the same name, is a fortified place, and was formerly of great strength, Lord Lake being compelled to raise the siege in 1805 after losing 3100 men. It was taken by Lord Combermere in 1827. The rajah's palace is a large building of red and yellow freestone presenting a picturesque appearance. Pop. 43,000.

**Bhutan** (bhu-tän'), an independent state in the Eastern Himalayas, with an area of about 16,800 sq. miles, lying between Thibet on the N. and Assam and the Jalpaiguri district on the S., and consisting of rugged and lofty mountains, abounding in sublime and picturesque scenery. Pop. est. at about 200,000. The Bhutanese are a backward race, governed by a *Dharm Rajah*, regarded as an incarnation of deity, and by a *Deb Rajah*, with a council (*Lenchen*). They are nominally Buddhists. After various aggressive incursions and the capture and ill treatment of Mr. Ashley Eden, the British envoy, in 1863, they were compelled to cede to the British considerable portions of territory, in return for a yearly allowance of £2500.

**Biafra** (bē-af'ra), BIGHT OF, an African bay running in from the Gulf of Guinea, having the Cameroon Mountains at its inner angle, and containing the island of Fernando Po.

**Bialystok** (be-ål'is-tok), or BJELOSTOK, town, Russian Poland, province of Grodno; well built, with a palace formerly belonging to the Counts Braniski, and known as the 'Polish Versailles.' Pop. 64,000.

**Biana** (be-å'nâ), a town of India, Bhurtpore, an old place with many temples, venerated by Mohammedans. Pop. 10,000.

**Biancavilla** (be-ân-kâ-vil'â), a town of Sicily on the southern side of Etna. Has cotton manufactures. Pop. 12,760.

**Bianchini** (be-ân-kē'nē), FRANCESCO, an Italian historian and astronomer, born in 1662. He was librarian to Cardinal Ottoboni, who on becoming pope, as Alexander VIII, raised him to the office of papal chamberlain; and Clement XI appointed him secretary to the commission for the correction of the calendar, and employed him to form a museum of Christian antiquities; left a portion of a *Universal History* and works on the planet Venus, and posthumously *Astronomicæo et Geographicæ Observationes Selectæ* (1737) and *Opuscula Varia* (1754). He died in 1729.

**Biard** (bē-ăr), AUGUSTE FRANÇOIS, a French *genre* painter, born in 1798; died in 1882. He traveled extensively, visiting Spain, Greece, Syria, Egypt, Mexico, Brazil, etc. Among his best known pictures have been the *Babes in the Wood* (1828); the *Beggar's Family* (1836); the *Combat with Polar Bears* (1839); and the *Strolling Players*, now in the Luxembourg. A strong element of caricature runs through most of his works.

**Biarritz** (be-ar-ritz'), a small seaport of France, Basses-Pyrénées, near Bayonne. It became a fashionable watering-place during the reign of Napoleon III, who had an autumn residence there. Pop. 13,629.

**Bias** (bi'as), one of the seven sages of Greece, born at Priene, in Ionia; flourished about 570 B.C. He appears to have been in repute as a political and legal adviser, and many sayings of practical wisdom attributed to him are preserved by Diogones Laertius.

**Bias** (bi-äs'), one of the five large rivers of the Punjab, India, rising in the Himalayas (13,326 ft.), and flowing first in a westerly and then in a

southerly direction until it unites with the Sutlej after a course of 300 miles.

**Bib**, a fish of the cod family (*Gadus luscus*), found in the British seas, about a foot long, the body very deep, esteemed as excellent eating. It is called also *pout* or *whiting pout*.

**Biberach** (bē'be-rȧh), a town of Würtemberg, Germany, on the Riss, formerly a free imperial city. It is an active fruit market. The French, under Moreau, defeated the Austrians near Biberach in 1796. Pop. 8390.

**Bible** (bī'bl; Greek *bibloi*, books, from *biblos*, the inner bark of the papyrus, on which the ancients wrote), the collection of the Sacred Writings or Holy Scriptures of the Christians. Its two main divisions, one received by both Jews and Christians, the other by Christians only, are improperly termed Testaments, owing to the confusion of two meanings of the Greek word *diathēkē*, which was applied indifferently to a covenant and to a last will or testament. The Jewish religion being represented as a compact between God and the Jews, the Christian religion was regarded as a new compact between God and the human race; and the Bible is, therefore, properly divisible into the Writings of the Old and New Covenants. The books of the Old Testament received by the Jews were divided by them into three classes: 1. The Law, contained in the Pentateuch or five books of Moses. 2. The Prophets, comprising Joshua, Judges, I and II Samuel, I and II Kings, Isaiah, Jeremiah, Ezekiel, and the twelve minor prophets. 3. The Kethubim, or Hagiographa (*holy writings*), containing the Psalms, the Proverbs, and Job, in one division; Ruth, Lamentations, Ecclesiastes, Esther, and the Song of Solomon, in another division; Daniel, Ezra, Nehemiah, and I and II Chronicles, in a third. These books are extant in the Hebrew language; others, rejected from the canon as apocryphal by Protestants, are found only in Greek or Latin.

The books of Moses were deposited, according to the Bible, in the tabernacle, near the ark, the other sacred writings being similarly preserved. They were removed by Solomon to the temple, and on the capture of Jerusalem by Nebuchadnezzar probably perished. According to Jewish tradition, Ezra, with the assistance of the great synagogue, collected and compared as many copies as could be found, and from this collation an edition of the whole was prepared, with the exception of the writings of Ezra, Malachi, and Nehemiah, added subsequently, and certain obviously later insertions in other books. The exact date of the determination of the Hebrew canon is uncertain. Between the last of the Old Testament writings (the canonical scriptures) and the rise of the New Testament there ensued a period of about one hundred and fifty years. Nevertheless, the literary spirit of the Jewish people did not rest during this time, but spent itself in producing works that bore an intimate relation to the racial history and sentiment. These writings were never invested by the stricter Jews with canonical dignity, one reason being perhaps that they were mainly written in Greek. The Hellenistic or Alexandrian Jews, however, were less strict, and admitted many of these later writings, forming what is now known as the *Apocrypha*, in which they were followed by the Latin Church. The Greek fathers, as also Augustine, seem to draw but a slight distinction between these apocryphal writings and the accepted Scriptures, and the Council of Trent gave them a position equal with the canonical writings of the Old Testament; but the Protestant churches at the Reformation gave their adherence to the restricted Hebrew canon, though the *Apocrypha* was long included in the various editions of the Bible. The New Testament is a collection of twenty-seven distinct writings, which have been divided as Historical, numbering five; Didactic, twenty-one; and Prophetical, one; the writings of the first division including more than half of the entire collection.

The earliest and most famous version of the Old Testament is the *Septuagint*, or Greek translation, executed by Alexandrian Greeks, and completed probably before 130 B.C., different portions being done at different times. This version was adopted by the early Christian church and by the Jews themselves, and has always held an important place in regard to the interpretation and history of the Bible. The Syriac version, the *Peshito*, made early in the second century after Christ, is celebrated for its fidelity. The Coptic version was made from Greek MSS. in the third or fourth century. The Gothic version, by Ulfilas, was made from the *Septuagint* in the fourth century, but mere insignificant fragments of it are extant. The most important Latin version is the *Vulgate*, executed by Jerome, partly on the basis of the original Hebrew.

The Apocrypha, or non-canonical books are fourteen in number and include First (Third) Esdras, Second (or Fourth) Esdras, Tobit, Judas, the parts of Esther not found in Hebrew or Chaldee, the Wisdom of Solomon, the Wisdom of Jesus, son of Sirach, Baruch; the song of the Holy Children, the

History of Susanna, Bel and the Dragon, The Prayer of Manasses (Manasseh) 1 and 2 Maccabees. All these are found in the Septuagint, were read as parts of the Sacred Scriptures by all Jews outside of Palestine; were accepted by the early Christians, were translated by Jerome as parts of his Latin Bible, *the Vulgate*, and to this day are regarded as Biblical by the Roman Catholic Church. The Protestant churches limit the Old Testament to the thirty-nine books originally written in Hebrew. Yet in the rubric of the Church of England at certain seasons are lessons from the Apocrypha. The use of this word Apocrypha with the reference of the word to these books, is found only among Protestant writers.

By 'the canon of Scripture,' or 'the canonical Books' (from the Greek word *canon*, 'a rule'), is meant those books which are looked upon as inspired and containing the standards for faith and conduct. That this opinion of the Old Testament books should become dominant among the Jews was a natural result of their origin, most of the books having been written, supposedly, by prophets who were recognized as inspired men. The Jews have always regarded Ezra (450 B. C.) as the scribe who gathered the scattered copies of the ancient writings, brought them together, and thereby framed the sacred canon. This cannot now be proved; but the prominence of Ezra in Jewish tradition, and the honor given to his memory as after Moses 'the second founder of Israel,' indicate that Ezra had some part in the collocation and selection of the Scriptures. In the opinion of the Palestinian Jews the canon was closed soon after the time of Ezra. But it is evident that some portions were added later, as the lists of high-priests in Nehemiah 12, going down to Jaddua, who ruled 330 B. C., some parts of Daniel which refer to events as late as 165 B. C., and Psalm 74, which undoubtedly refers to the terrible persecution of the Jews by the Syrians, 170 B. C. It is evident that the Hebrew Bible about 100 B. C. embraced the same books as we find in the Old Testament of our English Bible. According to the Hellenistic or Grecian Jews, who included the Apocrypha, the canon was not closed until 130 B. C. or even later. In every synagogue throughout the Jewish world, the Scriptures were read, from the Law, the Prophets, and the Psalms. This required a constant supply of written copies, especially as the volumes or rolls were laid aside as soon as they showed signs of wear. They were generally handed over to the schoolmaster, who held during the week, 'the Vineyard,' which was their name for the boys' school. When entirely worn out, the copies of the Scriptures were either buried or burned, a regular funeral service being held. This fact explains how it is that no very ancient copies of the Hebrew Bible are now in existence, the earliest, it is said, belonging to the seventh century A. D.

The printed editions of the Hebrew Bible are very numerous. The first edition of the entire Hebrew Bible was printed at Soncino in 1488. The editions of Athias (1661 and 1667) are much esteemed for their beauty and correctness. Van der Hooght followed the latter. Dr. Benjamin Kennicott did more than any one of his predecessors to settle the Hebrew text. His Hebrew Bible appeared at Oxford in 1776-80, two vols. folio. The text is from that of Van der Hooght, with which 630 MSS. were collated. De Rossi, who published a supplement to Kennicott's edition (Parma, 1784-99, five vols. 4to), collated 958 MSS. The German Orientalists, Gesenius, De Wette, and others, in recent times, have done very much toward correcting the Hebrew text.

As the Christian religion began among the Jews, and for nearly a generation was largely Jewish in its membership, the Old Testament was held in the same honor and authority in the church as it had been held in the synagogue. With it began to be read the gospels and epistles of the New Testament as soon as these were circulated among the churches. Although there was no New Testament Apocrypha corresponding to that of the Old Testament, some books were slow in recognition and acceptance, as II Peter, Jude, Hebrews and Revelation; while in some churches, 'The Shepherd of Hermas' and a few other books not in our New Testament were read. But by gradual use and common consent the twenty-seven books constituting the New Testament came to be recognized as Scripture, and the decrees of the councils later, beginning with that of Laodicea, in 363 A. D., simply confirmed the general usage. Whoever will take the trouble to examine the books of the 'New Testament Apocrypha'—not an ancient but a modern collocation—will readily understand why these early writings were soon dropped from the list of the New Testament canon. All the books of the New Testament were written in Greek, except possibly the Gospel by Matthew, which may have been originally written in Aramaic, the common tongue of Palestinian Jews. The Greek of the New Testament is not that of the old classic writings, the language of Plato

and Sophocles, but a later, Hellenistic Greek, such as was spoken throughout the eastern world in the first century A. D. The three oldest manuscripts of the New Testament known to be in existence are (1) the Sinaitic MS., discovered by Tischendorf in a convent on Mount Sinai in 1844, assigned to the middle of the fourth century; (2) the Vatican MS. at Rome, of similar date; (3) the Alexandrine MS. in the British Museum, assigned to the middle of the fifth century. Each MS. contains also the Septuagint Greek of the Old Testament in great part. The Vulgate of Jerome embraces a Latin translation of the New as well as of the Old Testament, based on an older Latin version. The division of the text of the New Testament into chapters and verses was introduced later than that of the Old Testament; but it is not precisely known when or by whom. The Greek text was first printed in the *Complutensian Polyglot*, in 1514; in 1516 an edition of it was published at Basel by Erasmus. Among recent valuable editions are those of Lachmann, Tischendorf, Tregelles, Westcott and Hort, and Souter.

The earliest translation of the Bible was, as we have seen, the Septuagint or Greek version of the Old Testament, made by Hellenistic Jews of Alexandria, and completed about 130 B. C. In Palestine it was regarded with great disfavor; and the Jews of Jerusalem long held a service of fasting, humiliation and prayer, on the anniversary of the day when the Scriptures began to be read in 'the tongue of the heathen.' But this dislike did not prevent the Septuagint from becoming the Jewish Bible in all the lands except Palestine. It is noteworthy, that nearly all the quotations from the Old Testament in the New, are taken from the Septuagint; for that version was adopted by the Christian churches wherever Greek was spoken.

Another series of translations of the Old Testament books were the *Targums* (Hebrew *targumim*, 'interpretations'). These were the renderings from the ancient Hebrews to the vernacular Aramaic given in the synagogues by the *methargamim* or official translators. They were spoken from the memory only, and not written down for centuries after their composition. The earliest of these now in existence is the Targum of Onkelos, perhaps written as early as the first or second century A. D., a translation of the Pentateuch or books of the Law. Other Targums on different parts of the Old Testaments are those named the Jerusalem Targum (Pentateuch), the Targum of Jonathan (Prophets), and Targums on the Psalms, Wisdom books, and on all the Old Testament except Ezra, Nehemiah and Daniel.

The most important of all the translations made in the early Christian church is that of Jerome (completed 405 A. D.), and embracing both the Old and New Testaments, including the Apocrypha, in the Latin language, known as the *Vulgate*, or 'common' version, as Latin was the current speech of all the lands west of Rome, including north Africa. This became the standard Bible of the church, was the only Bible in use during the Middle Ages, and remains to this day the version accepted by the Roman Catholic Church.

Of translations of the Bible into modern languages the English and the German are the most celebrated. Considerable portions were translated into Anglo-Saxon, including the Gospels and the Psalter. John Wycliffe's translation of the whole Bible (from the *Vulgate*), begun about 1356, was completed shortly before his death, which took place in 1384. The first printed version of the Bible in English was the translation of William Tyndall or Tyndale, whose New Testament was printed in quarto at Cologne in 1525, and soon afterward in octavo at Worms. The Pentateuch was published by Tyndale in 1530, and afterward some of the prophetical books. Our Authorized Version in the New Testament has embodied much of Tyndall's work, and owes more to him than to any other translator. A translation of the entire Bible, from German and Latin versions was published in 1535 by Miles Coverdale, an Augustinian friar; but it is inferior to Tyndall's. In 1539 appeared 'the Great Bible,' the first printed in England by royal authority, and ordered to be placed in every parish church. It was edited by Thomas Cranmer, Archbishop of Canterbury under Henry VIII. In 1557–1560 an edition appeared at Geneva, based on Tyndall's, the work of Whittingham, Gilby and other exiles, called the Geneva Bible. This became the Bible of the Puritans, and was for sixty years the most popular in England. It was the first printed in Roman letters, the first divided into verses, and the first to give words not in the original in italics. The Bishop's Bible (1568–1572) was based on Cranmer's, prepared by eight bishops of the Church of England, under the supervision of Archbishop Parker. Although authorized, it did not commend itself to scholars or the people. In 1582, an edition of the New Testament, translated by Roman Catholic scholars from the Latin Vulgate, appeared at Rheims, and in

1609–1610 the Old Testament was published at Douay. This is the Douay Bible, endorsed and circulated by the Roman Catholic Church.

In the reign of James I, a new translation was undertaken by forty-seven scholars. The revision was begun in 1607, and occupied three years, the completed work being published in folio in 1611. By the general accuracy of its translation and the purity of its style it superseded all other versions. This is the Authorized Version still in common use. After two hundred and fifty years of publication, a desire for a revision arose, and in 1870 the Convocation of Canterbury appointed a committee to consider the question of a new version. Upon the recommendation of this committee, companies were formed for the translation of the Old and New Testaments; and two similar companies were organized in America to aid them. The Revised Version of the New Testament appeared in 1881, of the Old Testament in 1884, not a new translation, but a revision of the Authorized Version, with comparatively few changes. The American Revisers had urged more extensive alterations, and in 1901 published the American Standard Version, embodying their judgment of a correct English text, now widely used in America, and to some extent in Great Britain.

In German, the most important version was that of Luther, of which the New Testament appeared in 1522, the Old Testament in 1534.

**Bible Christians,** a small sect founded by a Cornish Methodist preacher called O'Bryan, who profess to follow only the doctrines of the Bible and reject all human authority in religion. Now merged in the United Methodist Church.

**Bible Communists.** See *Perfectionists.*

**Bible Publishing.** The copyright of the Bible is in Great Britain vested in the Crown, but in the United States the government exercises no control over the publication. Until about 1880 most of the Bibles were imported from England but Bible publishing now gives employment to many printers and binders, and the work turned out by them is unsurpassed in any other country. Most of the trade is done in two styles—cloth and flexible leather with turned-over edges ('divinity circuit').

**Bible Societies,** societies formed for the distribution of the Bible or portions of it in various languages, either gratuitously or at a low rate. A clergyman of Wales, whom the want of a Welsh Bible led to London, occasioned the establishment of the British and Foreign Bible Society, March 7, 1804. A large number of similar institutions were soon formed in all parts of Great Britain, and afterwards on the Continent of Europe, in Asia and in America, and connected with the British as a parent or kindred society. Since the formation of the British and Foreign Bible Society it has circulated numerous versions or the whole or parts of the Scriptures in 400 different languages. More than half of the expenditure of their society has been devoted to the diffusion of the Authorized Version of the Bible, which by one of its original laws was the only one it was permitted to circulate. In 1901 this law was widened to include the Revised Version. The total issues to 1910 were about 226,000,000 copies, while many other millions have been distributed by the kindred societies which have sprung out of it. The Edinburgh Bible Society established in 1809, and up to 1826 connected with the British and Foreign Bible Society, seceded on the occasion of a controversy regarding the circulation of the Apocrypha, and up to 1860 existed as a separate society. In 1861 this society was united with the National, the Glasgow, and other Bible societies, into a whole called the National Bible Society of Scotland, having its headquarters in Edinburgh and Glasgow. The Hibernian Bible Society, which has its headquarters in Dublin, was established in 1806, to encourage a wider circulation of the Bible in Ireland. In Germany the principal Bible society is the Prussian, established at Berlin in 1805 and having many auxiliaries. France has two principal Bible Societies, whose headquarters are at Paris, the one instituted in 1818, the other in 1833. Switzerland possesses various Bible societies, chief among which are those of Basel (1804), Bern, Lausanne, and Geneva. In the Netherlands there has existed since 1815 a fraternal union of different sects for the distribution of Bibles. The Swedish Bible Society was instituted in 1814, and the Norwegian Bible Society in 1816. The first Russian Society in St. Petersburg printed the Bible in thirty-one languages and dialects spoken in the Russian dominions, and auxiliary societies were formed at Irkutsk, Tobolsk, among the Kirghises, Georgians, and Cossacks of the Don; but they were all suppressed by an imperial ukase in 1826. In the United States the great American Bible Society, formed in 1816, acts in concert with auxiliary societies in all parts of the Union, and issues annually over 2,000,000 volumes. Its total issue since its organization amounts to nearly 90,000,000. This includes Bibles

in many foreign tongues and the languages of several Indian tribes. The first such translation was made by John Eliot, the 'Apostle of the Indians' (1661–63), into the language of the Indians of Massachusetts.

**Bib'lia Pau'perum** ('Bible of the poor'), the name for block-books common in the middle ages, and consisting of a number of rude pictures of Biblical subjects with short explanatory text accompanying each picture.

**Bibliography** (bib-li-og'ra-fi; Gr. *biblion*, a book, and *graphō*, I describe), the knowledge of books, in reference to the subjects discussed in them, their different degrees of rarity, curiosity, reputed and real value, the materials of which they are composed, and the rank which they ought to hold in the classification of a library. The subject is sometimes divided into *general*, *national*, and *special* bibliography, according as it deals with books in general, with those of a particular country, or with those on special subjects or having a special character (as early printed books, anonymous books). A subdivision of each of these might be made into *material* and *literary*, according as books were viewed in regard to their mere externals or in regard to their contents.

Hardly any branch or department of bibliography has as yet been quite adequately treated. The reduction of bibliographic material to something like method and system was undoubtedly the work of France. Brunet's *Manuel du Libraire*, containing, in an alphabetical form, a list of the most valuable and costly books of all literatures; Barbier's *Dictionnaire des Ouvrages Anonymes;* Renouard's *Catalogue d'un Amateur*, for a long time the best guide of French collectors; and the *Bibliographie de la France*, recording the yearly accumulation of literary works, were all first works in their respective departments. The authors of anonymous and pseudonymous works are made known in Barbier's *Dictionnaire des Ouvrages Anonymes et Pseudonymes* (Paris, 1806–9), treating only of French and Latin works; Quérard's *Dictionnaire des Ouvrages Polyonymes et Anonymes de la Littérature Française* (Paris, 1854–56), and his *Supercheries Littéraires Dévoilées* ('Literary Frauds Unveiled,' Paris, 1845–56). Lorenz's *Catalogue Général de la Librairie Française* (1867–87), include the important French bibliographical books of the nineteenth century.

The beginnings of English bibliography are to be found in Blount's *Censura Celebrorum Auctorum* (1690), and Oldy's *British Librarian* (1737). Among library catalogues of which it can boast are those of the Bodleian Library, the British Museum (only partly printed), and the Advocates' Library, Edinburgh. Catalogues compiled on a scientific system, by which the reader is assisted in his researches after books on a particular subject are not uncommon on the European continent; but the only extensive one of the kind in Britain is that of the Signet Library, Edinburgh. A valuable classified catalogue, so far as it goes, is Sonnenschein's *The Best Books*, a guide to about 25,000 modern works on all subjects. Of other English bibliographical works we may mention the *Typographical Antiquities* of Ames, Herbert, and Dibdin; Brydges' *Censura Literaria* (1805); Dibdin's *Bibliographical Decameron* (1817); Dr. Robert Watt's *Bibliotheca Britannica* (1824, 4 vols., two of subjects and two of authors); Lowndes's *Bibliographer's Manual*, edited by H. G. Bohn, 1869; S. A. Allibone's *Critical Dictionary of English Literature and British and American Authors* (1859–71), etc. The bulky booksellers' catalogues of Bohn and Quaritch, Low's English catalogue of books published from 1835 onwards, in continuation of the London catalogue giving all English books published from 1700; and the *Reference Catalogue of Current Literature* are also valuable bibliographical works. The *Dictionary of the Anonymous and Pseudonymous Literature of Great Britain* by Halkett and Laing (4 vols., 1882–88) is of high value. American literature has already given rise to a series of bibliographical works on both sides of the Atlantic, *e.g.* Ternaux-Compans's *Bibliothèque Américaine*, 1837; Rich's *Bibliotheca Americana Nova*, giving books published between 1700 and 1844; *Bibliographical Catalogue of Books, Translations of the Scriptures, and other Publications in the Indian Tongues of the United States*, 1849; Duyckinck's *Cyclopedia of American Literature*, 1856; Trübner's *Bibliographical Guide to American Literature*, 1856; and the *General American Catalogue* compiled by Lynde E. Jones and F. Leypoldt, 1880, with works of more recent date.

Of German bibliographical works we shall only mention Heinsius's *Allgemeines Bücherlexikon*, giving books published between 1700 and 1888, and Keyser's *Vollständiges Bücherlexikon*, giving books published between 1750 and 1882. German bibliography is particularly

rich in the literature of separate sciences; and the bibliography of the classics and of ancient editions was founded by the Germans. See also *Bibliomania*.

**Bibliomancy** (bib'li-o-man-si), divination performed by means of books, and especially of the Bible; also called *sortes biblicæ* or *sortes sanctorum*. It consisted in taking passages at hazard, and drawing indications thence concerning things future, in the same way that the ancients drew prognostications from the works of Homer and Virgil. In 465 the Council of Vannes condemned the practice, as did the Councils of Agde and Orleans.

**Bibliomania** (bib-li-o-mā'ni-a, 'book madness'), a passion for possessing curious books. The true bibliomanist is determined in the purchase of books less by the value of their contents than by certain accidental circumstances attending them, as that they belong to particular classes, are made of singular materials, or have something remarkable in their history. One of the most common forms of the passion is the desire to possess complete sets of works, as of the various editions of the Bible or of single classics; of the editions *in usum Delphini* and *cum notis variorum;* of the Italian classics printed by the Academy *della Crusca;* of the works printed by the Elzevirs or by Aldus. Scarce books, prohibited books, and books distinguished for remarkable errors or mutilations have also been eagerly sought for, together with those printed in the infancy of typography, called *incunabula*, first printed editions (*editiones principes*) and the like. Other works are valued for their miniatures and illuminated initial letters, or as being printed upon vellum, upon paper of uncommon materials, upon various substitutes for paper, or upon colored paper, in colored inks, or in letters of gold or silver. In high esteem among bibliomanists are works printed on large paper, with very wide margins, especially if uncut, also works printed from copper plates, *editions de luxe*, and limited issues generally. Bibliomania often extends to the binding. In France the bindings of Derome and Padeloup are most valued; in England those of Charles Lewis and Roger Payne. Many devices have been adopted to give a factitious value to bindings. Jeffery, a London bookseller, had Fox's History of King James II bound in fox-skin; and books have been more than once bound in human skin. The edges of books are often ornamented with paintings, etc., and marginal decoration is frequently an element of considerable value. Another method of gratifying the bibliomaniac taste is that of enriching works by the addition of engravings—illustrative of the text of the book —and of preparing only single copies.

**Bibracte**, ancient Gaulish town, the capital of Ædui in the time of Cæsar. Excavation on a hilltop 2500 ft. above sea-level has uncovered an area of 230 acres surrounded by a stone and wood rampart 3 miles long, containing remains of dwellings, a temple of Bibractis and workshops of iron and bronze workers and enamelers.

**Bibulus**, MARCUS CALPURNIUS, consul with Julius Cæsar, 59 B.C. For his opposition to the policy of Cæsar he suffered ill treatment by the mob, and shut himself up in his house, taking no part in the proceedings of public business, whence arose the jest that Julius and Cæsar were consuls that year. He died about the year 32.

**Bicarbonate** (bī-kär'bo-nāt), a carbonate derived from carbonic acid ($H_2CO_3$) by replacing one of the atoms of hydrogen by a metal. Bicarbonate of sodium ($NaHCO_3$) is used as an antacid, and efferverscing liquors are usually produced by mixing it with tartaric acid. It is also the chief ingredient of baking-powder.

**Biceps** (bī'seps), in anatomy the term applied to two muscles, one belonging to the arm, the other to the leg, and known respectively as the *biceps flexor cubiti* and the *biceps flexor cruris*. The former is the muscle which gives a full appearance to the front of the upper arm; the latter is situated on the back of the thigh, and is one of a group of three muscles known as 'hamstrings.'

**Bicêtre** (bē-sātr), a village of France, S. W. of Paris, with a famous hospital for old men and an asylum for lunatics. Founded by Louis IX as a Carthusian monastery, it was rebuilt by Louis XIII as a hospital for old soldiers.

**Bichat** (bē-shä), MARIE FRANÇOIS XAVIER, a French anatomist and physiologist, born at Thoirette in 1771; died in 1802. He wrote *Traité sur les Membranes*, which was translated into almost all the languages of Europe, *Recherches sur la Vie et la Mort*, and *Anatomie Générale*.

**Bickerstaffe** (bik'er-staf), ISAAC, a dramatic writer, born in Ireland about 1735; died in obscurity on the continent about 1812. Some of his best-known plays are *Maid of the Mill, He Would if He Could, Love in a Village.* —In English literature the name *Isaac Bickerstaffe* occurs as the name assumed by Swift in his controversy with Partridge, the almanac maker, and also as the pseudonym of Steele as editor of the *Tatler*.

**Bickersteth** (bik'er-steth), EDWARD, a clergyman of the Church of England, born in 1786; died in 1850. He took orders and became rector of Watton in Hertford. He was one of the founders of the Evangelical Alliance.

**Bickerton,** SIR RICHARD HUSSEY, an English admiral, born 1759; died 1832. He was captain of the 'Invincible' in the action off Martinique in 1781. In 1804 served as second in command to Lord Nelson in the Mediterranean. He was given the rank of admiral in 1810.

**Bickmore,** ALBERT SMITH, naturalist, born at St. George, Maine, in 1839. He graduated at Dartmouth in 1860. Studied under Agassiz, and traveled in the East, publishing in 1869 *Travels in the East Indian Archipelago.* He became professor of natural science in Madison University and superintendent of the Museum of Natural History in New York City. Died 1914.

**Bicycle** (bī'si-kl), a light-wheeled vehicle propelled by the rider, consisting of two wheels attached to a frame composed of tubing. Between these is arranged an axle, attached to the lower part of the frame, to which are affixed two pedals, one on either side; to this axle is attached a sprocket-wheel over which runs an endless chain connecting with a smaller sprocket on the rear wheel. A chainless bicycle has also been devised, bevel gears and rod, incased in a metal covering, taking the place of the chain and sprocket wheel. The frames are distinguished as 'diamond' and 'drop'; the former used by men, the latter by women cyclists. The rider sits upon a saddle attached to a seat-post affixed to a frame; he steers the machine by means of a handle-bar, which turns the front wheel in any direction required. The momentum of the vehicle, the action of the rider's body and the proper use of the handle or steering bar keeps it in an upright position. The bicycle attained extraordinary popularity during the latter decades of the nineteenth century, but has since been much less used. The original bicycle was made with a large wheel forward and a very small wheel in the rear, the pedals being attached directly to the axle of the large wheel and the seat to a rod above the large wheel which connected the small wheel to the handle bar. This has been replaced by the more satisfactory safety bicycle in which the wheels are of equal size. Motorcycles, moved by gasoline engines, have recently come into common use. See *Motorcycles.*

**Bida** (bē'dä), a town and administrative district in the British protectorate of Northern Nigeria, Africa.

**Bidar** (bē'dur), a town in the Nizanis dominions, India. Has manufactures of metal goods, to which it has given the name Biddery wave. Pop. 11,000.

**Bidassoa** (be-das-sō'a), a small river of Spain, forming for some distance the boundary between France and Spain.

**Biddeford** (bid'e-ford), a city of York Co., Maine, on the Saco, opposite to the city of Saco, with which it is connected by several bridges. The falls of the Saco, 42 feet high, here afford valuable water-power, used in large cotton and machinery factories, and saw mills. Pop. 17,079.

**Bidder,** GEORGE PARKER, English engineer, born 1806; died 1878. He was associated with Robert Stephenson in the construction of the London and Birmingham railway, later constructing railway systems at home and on the Continent; planned the Victoria Docks, invented the railroad swing-bridge, and was one of the founders of the first electric telegraph companies.

**Biddle,** CLEMENT, American military officer, born in Philadelphia, Pa., May 10, 1740; died there July 14, 1814. He was descended from a New Jersey Quaker family, and organized a Quaker company of volunteers for the revolutionary army, in 1775. He was one of the framers of the state constitution; fought at Trenton, Princeton, Brandywine, Germantown and Monmouth, and was at Valley Forge.

**Biddle,** JAMES, American naval officer, born in Philadelphia, Pa., Feb. 28, 1783. He was wrecked in the frigate *Philadelphia,* off Tripoli, in 1803, and held as a prisoner 19 months. As first lieutenant of the *Wasp* he led the boarders in the action with the *Frolic,* Oct. 18, 1812. In command of the *Hornet* he captured the *Penguin,* March 23, 1813. He died Oct. 1, 1848.

**Biddle,** JOHN, founder of English Unitarianism, born in 1615; died in prison in 1662. He was educated at Oxford, and became master of the free-school at Gloucester. He was repeatedly imprisoned for his anti-Trinitarian views. A general act of oblivion in 1652 insured him his liberty, when he immediately disseminated his opinions both by preaching and by the publication of his *Twofold Scripture Catechism.* He was again imprisoned and to save his life Cromwell banished him to St. Mary's Castle, Scilly, and assigned him a hundred crowns annually. Here he remained until liberated in 1658. He continued to preach till the death of Cromwell, and also after the Restoration, when he was committed to jail in 1662, and died a few months after.

**Biddle,** NICHOLAS, naval officer, born at Philadelphia in 1750. He entered the British navy in 1770, served in the same ship with Nelson, and in 1776 returned to America and was one of the first naval officers in the patriot cause. As captain of the *Andrew Davis* he captured several prizes. In 1777 he took command of the frigate *Randolph*, and in an engagement in March, 1778, with the British frigate *Yarmouth*, the magazine of the *Randolph* exploded, Captain Biddle and nearly all his crew being killed.

**Biddle,** NICHOLAS, financier, nephew of the preceding, was born at Philadelphia in 1786; died in 1844. He edited for a time *The Portfolio*, a literary journal; in 1810 was elected to the Pennsylvania legislature; served in the State Senate 1814–17; and in 1819 was appointed a director of the United States Bank by President Monroe. In 1823 he became president of that institution, and by virtue of his financial measures supplied the country with a uniform currency. After the veto of the bank charter bill by President Jackson in 1832 and the closing of the Bank in 1836, a 'United States Bank' was chartered by the State of Pennsylvania and Mr. Biddle made its president. It was conducted in a way that led to its failure in 1841, a disaster for which President Biddle was severely blamed. He was also president of the board of trustees of the fund left by Stephen Girard for the establishment of a college for orphan boys.

**Biddle University,** a Presbyterian institution, located near Charlotte, N. C., for the education of negroes. It was founded in 1867.

**Bideford** (bid'e-ford), a munic. borough and seaport of England, County Devon. Its industries embrace coarse earthenware, ropes, sails, etc. Pop. 9074.

**Bidens,** a genus of herbaceous composite plants related to *Dahlia* and *Coreopsis*. Commonly known as beggar's-lice.

**Bidery** (bid'e-ri; from *Bidar*, a town in India.) A kind of East Indian ornamental metal-work, consisting of damascening silver on some metal ground blackened by certain chemicals. The alloy used as the basis of the damascene work is of bronze or brass, and is highly resistive of corrosion.

**Bidpai** (bid'pi), or PILPAI (pil'pi), the reputed author of a very ancient and popular collection of Eastern fables. The original source of these stories is the old Indian collection of fables called *Panchatantra*, which acquired its present form under Buddhist influences not earlier than the second century B.C. It was afterwards spread over all India and handed down from age to age in various more or less different versions. An abridgment of this collection is known as the *Hitopadesa*. The *Panchatantra* was translated into Pehlevi in the sixth century of our era. This translation was itself the basis of a translation into Arabic made in the eighth century; and this latter translation is the medium by which these fables have been introduced into the languages of the West. The first English translation was published in 1570.

**Biebrich** (bē'brih), a town of Prussia, district Wiesbaden, on the right bank of the Rhine, with a fine castle, formerly the residence of the Dukes of Nassau. Pop. 20,137.

**Biel** (bēl). See *Bienne*.

**Biela's Comet** (bē'la), discovered by M. Biela (1782–1856), an Austrian officer, in 1826. Its periodic time was determined as 6 years 38 weeks. It returned in 1832, 1839, 1846, and 1852. On the latter two occasions it was in two parts, each having a distinct nucleus and tail. It has not since been seen as a comet; but in 1872, 1879, and 1885, when the earth passed through the comet's track, immense flights of meteors were seen, which have been connected with the broken-up and dispersed comet.

**Bielef** (by-ā'lef), a town in Russia, government of Tula, with manufactures of soap, leather, etc., and a considerable trade. Pop. 9567.

**Bielefeld** (bē'le-felt), a town of Prussia, in the province of Westphalia, 38 miles E. from Münster; one of the chief places in Germany for flax-spinning and linen manufacture. Pop. 71,797.

**Bielgorod** (byel'go-rod), a town, Russia, in the government of Kursk, 76 miles S. from the town of Kursk, on the Donetz. It is the seat of an archbishop's see, and has important fairs. Pop. 21,850.

**Bielitz** (bē'lits), a town of Austrian Silesia, 42 miles W. S. W. of Cracow, with manufactures of woolens and linens, dye-works and printfields. Pop. 16,885.

**Biella** (bē-el'lā), a town of North Italy, province of Novara, 36 miles N. N. E. of Turin. Pop. 3454.

**Bielo-Ozero** (byā'lo-o-zā'ro; 'white lake,' from its white clay bottom), a Russian lake, government of Novgorod, 25 miles long by 20 broad. An old wooden town, Bielozersk, is on the S. shore of the lake. Pop. 4286.

**Bielopol** (byā'lo-pol), a Russian town, government of Kharkov. Pop. 15,233.

**Bielsk** (byelsk), a town of Russia, gov. of Grodno. Pop. 10,000.

**Bieltsi** (byel'tsi), a town of Russia, prov. Bessarabia. Pop. 18,000.

**Bienhoa** (bi-en-hwä'), a town in Cochin-China, capital of a province of the same name, 20 miles N. of Saigon.

**Biennial** (bī-en'i-al), a plant that requires two seasons to come to maturity, bearing fruit and dying the second year.

**Bienne** (bi-ăn), or BIEL (bēl), a town of Switzerland, canton of Bern, 16 miles N. W. of Bern, beautifully situated at the N. end of the lake of same name, and at the foot of the Jura. Watchmaking is an extensive industry. Pop. 22,016.—The LAKE is about 7½ miles long by 3 broad. It receives the waters of Lake Neufchâtel by the Thiel and discharges itself into the Aar.

**Bienville** (byan-vēl), JEAN BAPTISTE LE MOYNE, Sieur de, American pioneer, born in Montreal, Canada, 1680; died in France 1768. In 1698 he founded a French settlement at Biloxi, near the mouth of the Mississippi River. He was governor of the colony of Louisiana 1701–13, 1718–26 and 1733 until about 1740. In 1718 he founded the city of New Orleans.

**Bierce,** AMBROSE, American author and journalist, born in Ohio, 1842. Served in the Civil War and was breveted major for distinguished services. Afterwards connected with the San Francisco Examiner. He has written a number of books, among them being *Fantastic Fables* and *The Shadow on the Dial.* He was killed in Mexico in 1914.

**Bierstadt** (bēr'stat), ALBERT, painter, born at Solingen, Germany, in 1828; died in 1902. His parents emigrated to New England in his infancy. Studying landscape painting in Germany in 1853–1856, he returned to the United States in 1857 and in 1858 accompanied General Lander's expedition to the Rocky Mountains. This resulted in his admired *View of the Rocky Mountains—Lander's Peak.* Other productions are *Sunlight and Shadow, Storm on the Matterhorn,* etc.

**Bies-Bosch** (bēs-bosk), a marshy sheet of water interspersed with islands, between the Dutch provinces of North Brabant and South Holland, formed by an inundation in 1421.

**Bifröst** (bif'rēst), in northern mythology the name of the bridge represented as stretching between heaven and earth (Asgard and Midgard); really the rainbow. It was used only by the gods and was guarded by Heimdal, the god of light.

**Bigamy** (big'a-mi), the act or state of having two (or more) wives or husbands at once, an offense by the laws of most states. By the law of England bigamy is a felony, punishable with penal servitude for any term not exceeding seven years and not less than three years, or imprisonment, with or without hard labor, not exceeding two years. If the party's wife or husband shall have been absent continuously for seven years and not known to be alive, the penalty is not incurred. The statutory provisions in the United States against bigamy are in general similar to and copied from the English statute, excepting as to the punishment, which differs in many of the States.

**Big Ben,** a great bell, weighing 13½ tons in the Westminster clock tower, London.

**Big Bethel,** a village between York and James rivers, Virginia, the scene of one of the early engagements of the Civil war. Here on June 10, 1861, the Federals (2500) under General Pierce were defeated by the Confederates (1800) under General Magruder.

**Big Black River,** a tributary of the Porcupine River in Alaska, into which it flows after a course of over 200 miles.

**Big Black River,** a tributary of the Mississippi, rising in Webster Co., Miss., and flowing S. W. into the Mississippi 20 miles above Vicksburg. Length 260 miles.

**Bigelow,** (big'e-lo), EDWARD FULLER, American scientist and writer on Nature-subjects, born in Connecticut 1860. For three years he was the editor of Popular Science, and of The Observer, a nature-magazine, for eight years; since 1900 editor of Nature and Science department St. Nicholas Magazine. Author of *Bigelow's Descriptive Plant Analysis,* etc.

**Bigelow,** ERASTUS BRIGHAM, inventor, born at West Boylston, Massachusetts, in 1814; died in 1879. He invented machines for carpet and counterpane weaving, which were a great improvement in those previously in use.

**Bigelow,** FRANK HAGAR, American meteorologist, born at Concord, Mass., in 1851, professor of meteorology in the United States Weather Bureau 1891–1910; since 1910 professor of meteorology in the Meteorological Office of Buenos Ayres.

**Bigelow,** JOHN, well-known author and journalist, born in Ulster Co., New York, in 1817; was graduated at Union College in 1835. He was prison-inspector at Sing Sing 1845–48 and in 1850 became associated with Bryant as editor of the New York *Evening Post,*

In 1861 he was appointed consul at Paris, in 1864 chargé-d'affaires, and in 1865 U. S. Minister. In 1875 was elected by the Democratic party Secretary of State for New York. His works include *Jamaica in 1850, or the Effects of Sixteen Years of Freedom on a Slave Colony; The United States in 1863* (in French), *Life of Benjamin Franklin*, and *The Useful Life*. Died in 1911.

**Bigelow,** POULTNEY, author and traveler, born at New York in 1855. After practising law in New York, he traveled widely as a newspaper correspondent and made canoe voyages up the principal rivers of Europe. His works include *The German Emperor and His Eastern Neighbors, Paddles and Politics down the Danube, White Man's Africa*, etc.

**Bigelow,** TIMOTHY, American soldier, born at Worcester, Mass., Aug. 12, 1739; died there March 31, 1790. On May 23, 1775, he led a company of minutemen to Cambridge; accompanied Arnold in his expedition to Quebec in 1775, where he was made a prisoner. As colonel he assisted in the capture of Burgoyne.

**Biggleswade** (big'gelz-wād), a town in England, County Bedford, giving name to a parl. div. of the county; manufactures of straw-plait. Pop. 5375.

**Big Horn,** the *Ovis montana*, or wild sheep of the Rocky Mountains, named from the size of its horns. The animal is stoutly built about 3½ ft. high at the shoulder. The big horns are gregarious, going in herds of twenty or thirty, frequenting the craggiest and most inaccessible rocks, and are wild and untamable. It is called also Rocky Mountain sheep.

**Big Horn Mountains,** a range principally in the N. portion of Wyoming, east of Big Horn River. It has summits 8000 to 12,000 feet high. In this region occurred the famous 'massacre of the Big Horn,' the slaughter by Indians in 1876 of General Custer's whole company of troops.

**Bignonia** (big-nō'ni-a), a genus of plants of many species, inhabitants of hot climates, nat. order *Bignoniaceæ*, usually climbing shrubs furnished with tendrils; flowers mostly in terminal or axillary panicles; corolla trumpet-shaped, hence the name of *trumpet-flower* commonly given to these plants. All the species are splendid plants when in blossom, and many of them are cultivated in gardens.

**Big Rapids,** a city, county seat of Mecosta Co., Michigan, 56 miles N. of Grand Rapids. There is good water-power, and there are extensive furniture and other wood-working industries. Pop. (1910) 4519.

**Big Sandy River** is an affluent of the Ohio River, formed by the junction of two branches which rise in West Virginia. The west fork traverses part of Kentucky and the east fork forms part of the boundary between West Virginia and Kentucky.

**Big Sioux River,** a tributary of the Missouri River. It rises in N. E. South Dakota and flows S., forming in its lower course the boundary between South Dakota and Iowa. It enters the Missouri 2 miles above Sioux City, after a course of 300 miles.

**Bihac** (bē-hăc'), a town and fortress in Bosnia. Pop. (1910) 6200.

**Bihari,** ALEXANDER, a Hungarian painter, born 1856; died 1906. Among his paintings are *A Roumanian Funeral* and *Gipsies with the Broken Violin Before the Country Justice*, the latter owned by the Austrian emperor.

**Bijanagur** or BIJNAGUR (bē j-n a-gur'), city of Hindustan, now in ruins, in the Madras presidency. Sacked by Mohammedans of the Deccan in 1565.

**Bijapur.** See *Bejauoor.*

**Bijawar,** petty native state, Bundelkhand Agency, India; area 974 sq. miles. Diamonds and ironstone are found. Pop. 110,000.

**Bijnaur.** (bij-nowr'), a town of Hindustan, Northwestern Provinces. Pop. 17,583.

**Bikanir** (bik-a-nēr'), a native state of India. A region of sand dunes, but many sheep, horses and camels are bred, and its salt lakes yield a good revenue. Area, 23,311 sq. miles; pop. 584,627.—BIKANIR, the capital, manufactures blankets, sugar-candy, pottery, etc. Pop. including suburbs, 53,100.

**Bikélas** (bi-kā'läs), DIMITRIOS, a Greek poet, born at Hermupolis, on the island of Syra, in 1835; died at Athens 1908. He wrote *Lukis Laras*, a story of the Greek war of independence, and besides producing a collection of poems, translated a number of Shakespeare's plays into modern Greek.

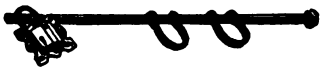
**Bilara,** town, Rajputana, India, with a population of 11,000.

**Bilaspur** (bi-läs-pör'), a district of the Central Provinces of India, generally hilly and traversed by the Mahanuddy. Area, 7602 sq. miles. Bilaspur is the principal town, situated on the Arpa. Pop. (1901) 18,937.

**Bilbao** (bil-bā'ō), a city in northern Spain, capital of the province of Biscay or Bilbao, on the navigable Nervion, 6 miles from the sea. It has a cathedral and several convents; possesses

large ship-yards and iron-foundries. It is one of the chief seaports of Spain and exports large quantities of iron-ore. Pop. 83,306.

**Bilboes** (bil'bōz), an apparatus for confining the feet of offenders, especially on board ships, consisting of a long bar of iron with shackles sliding on it and a lock at one end to keep them from getting off, offenders being thus 'put in irons.'



Bilboes, from the Tower of London.

**Bilderdijk** (bil'dėr-dīk), WILLEM, an eminent Dutch poet, born 1756; died 1831. His contributions to the literature of his country were many and varied, including works on philology, history, and poetry, including translations from the Greek and Latin poets.

**Bile** (bīl), a yellow bitter liquor, separated from the blood by the primary cells of the liver, and collected by the biliary ducts, which unite to form the hepatic duct, whence it passes into the duodenum, or by the cystic duct into the gall-bladder to be retained there till required for use. The most obvious use of the bile in the animal economy is to aid in the digestion of fatty substances and to convert the chyme into chyle. It appears also to aid in exciting the peristaltic action of the intestines. The natural color of the fæces seems to be due to the presence of bile. The chemical composition varies with the animal which yields it, but every kind contains two essential constituents, the bile salts and the bile coloring matter. The bile salts are a glycocholate and a taurocholate of soda; the bile-pigments are bilirubin and biliverdin. Mucin is another constituent, giving to the bile its viscid quality. The other organic substances include fats and soaps, and cholesterin, which is a crystallizable substance usually the chief constituent of gall-stones.

**Bilge** (bilj), the breadth of a ship's bottom, or that part of her floor which approaches to a horizontal direction, on which she would rest if aground. —*Bilge-water*, water which enters a ship and lies upon her bilge or bottom; when not drawn off it becomes dirty and offensive.—*Bilge ways*, planks of timber placed under a vessel's bilge on the building-slip to support her while launching.

**Bilgram,** a town in the United Provinces, British India, with remains of an ancient fort and temples of Srinagar, built by Sri Ram. Pop. 11,000.

**Bilharzia,** a genus of trematodes, containing a parasite that is injurious to man. This organism was discovered in 1852 by Bilharz, hence the name, though it was later named *Schistosoma hæmatobium*. Its presence, in the mucous membrane of the urinary tract gives rise to the condition known as bilharziosis, a malady characterized by hæmaturia, inflammation, etc. It is found in Africa.

**Biliary Calculus,** a concretion which forms in the gall-bladder or bile-ducts; gall-stone. It is generally composed of a peculiar crystalline fatty matter which has been called *cholesterin*, also bile-salts and calcium salts.

**Bilin** (be-lēn'), a town of Bohemia, 42 miles N. W. Prague, prettily situated in the vale of Bila, and celebrated for its mineral waters, which are drunk on the spot and largely exported. Pop. 7800.—Also the name of a river in Burmah, British India, 280 miles long.

**Bilirán** (bē-lē-rän'), an island of the Philippines, off the north coast of Leyte and belonging to Leyte Province. Its surface is generally mountainous, with Mabin its highest peak, 4430 ft. The area of the island is 190 sq. miles. Pop. 19,147.

**Biliton.** See *Billiton*.

**Bill,** a cutting instrument hook-shaped towards the point, or with a concave cutting edge; used by plumbers, basket-makers, gardeners, etc., made in various forms and fitted with a handle. Such instruments, when used by gardeners for pruning hedges, trees, etc., are called *hedge-bills* or *bill-hooks*. Also an ancient military weapon, consisting of a broad, hook-shaped blade, having a short pike at the back and another at the summit, attached to a long handle, used by the English infantry especially in defending themselves against cavalry down to the fifteenth century, and by civic guards or watchmen down to the end of the seventeenth.

Old English Bill, time of Elizabeth.

**Bill,** a written or printed paper containing a statement of any particulars. In common use a tradesman's account, or a printed proclamation or advertisement, is thus called a bill. In legislation a bill is a draft of a proposed statute submitted to a legislative assembly for approval, but not yet enacted or passed and made law. When the bill has passed and received the necessary assent it becomes an act.

*Bill of Attainder* and of *Pains and Penalties* are forms of procedure in the

British Parliament which were often resorted to in times of political agitation to procure the criminal condemnation of an individual. The person attainted lost all civil rights, he could have no heir, nor could he succeed to any ancestor, his estate falling to the crown. These bills were promoted by the crown, or the dominant party in Parliament, when any individual obnoxious to it could not readily be reached by the ordinary forms of procedure. Parliament being the highest court of the kingdom could dispense with the ordinary laws of evidence, and even, if actuated by passion or servilely devoted to the authorities, condemn the accused in the most arbitrary manner. They were very common under the Tudors, and as late as 1820 the trial of Queen Caroline took place under a bill of pains and penalties. Bills of attainder are prohibited by the constitution of the United States.

*Bill of Costs* is an account rendered by an attorney or solicitor of his charges and disbursements in an action or in the conduct of his client's business.

*Bill of Entry*, a written account of goods entered at the custom-house.

*Bill of Exchange* (including *promissory notes* and *inland bills* or *acceptances*). A bill of exchange is defined as an order in writing addressed by one person to another, signed by the person giving it, requiring the person to whom it is addressed to pay on demand or at a fixed or determinable future time a certain sum of money to or to the order of a specified person or to bearer. Bills of exchange are divided into foreign and inland bills, but in mercantile usage the term bill of exchange is seldom applied to other than foreign bills. An inland bill of exchange, generally called a bill of acceptance, has more in common with a promissory note than with a foreign bill of exchange. We give the common forms of the three documents.

(1) *Promissory Note.*

$110.00. Philadelphia, January 2, 1912.

Three months after date I promise to pay to the order of W. S. [or 'to W. S. or his order'] the sum of One Hundred and Ten Dollars, for value received. (Signed) J. D.

(2) *Inland Bill of Acceptance.*

$11.00. Philadelphia, January 2, 1912.

Three months after date pay to our order [or 'to the order of W. S.'] the sum of One Hundred and Ten Dollars, for value received.

(Signed) F. G. & Co.

To Messrs. A. B. & Co., New York.

This form is accepted by writing across the body of the bill:—

'Accepted,
A. B. & Co.'

(3) *Foreign Bill of Exchange.*

$110.00. Lima, January 2, 1912.

At sixty days' sight of this first of exchange (second and third of same tenor and date unpaid) pay to the order of W. S. the sum of One Hundred and Ten Dollars, value as advised [or 'which charge to our account,' or 'to account of——as advised.'] (Signed) F. & Co.

To F. B. & Co., Liverpool.

(Second and third drawn in same form as the first, one only of the set being negotiable. Instead of three copies being used, which is called drawing a bill in parts, one only may be drawn, the form then used being 'this sola of exchange.')

The acceptor of this bill writes across it the date on which it is presented, together with his signature, thus:—

'Accepted Feb. 3, 1912.
F. B. & Co.'

There is usually a current rate of discount for first-class bills, which is determined in Great Britain by the rates of the Bank of England. When a bill reached the date of payment, and was not duly paid, it used to be *noted* or *protested*, but this is now only done with foreign bills. Protesting is a legal form, in which the payee is declared responsible for all consequences of the non-payment of the bill. Noting is a temporary form, used as a preliminary to protesting. It consists in a record by a notary-public of the presentation of the bill and of the refusal of the payee to honor it. Unless a bill is noted for non-payment on the due date, the endorsers are freed from responsibility to pay it. In determining the due rate of a bill, a legal allowance, varying in different countries, called *days of grace*, has to be taken into account. In Great Britain three days of grace are allowed on all bills indiscriminately, except bills drawn on demand. A bill of exchange drawn and accepted merely to raise money on, and not given, like a genuine bill of exchange, in payment of a debt, is called an *accommodation bill*. Different States in America have different laws respecting days of grace, and some have abolished days of grace. The same is the case in some European countries; in others the grace varies from three to thirty days.

*Bill of Health*, a certificate or instrument signed by consuls or other proper authorities, delivered to the masters of ships at the time of their clearing out from all ports or places suspected of be-

ing particularly subject to infectious disorders, certifying the state of health at the time that such ships sailed.

*Bill of Indictment*, a written accusation submitted to a grand-jury. If the grand-jury think that the accusation is supported by probable evidence, they return it to the proper officer of the court endorsed with the words 'a true bill,' and thereupon the prisoner is said to stand indicted of the crime and bound to make answer to it. If the grand-jury do not think the accusation supported by probable evidence, they return it with the words 'no bill,' whereupon the prisoner may claim his discharge.

*Bill of Lading*, a memorandum of goods shipped on board of the vessel, signed by the master of the vessel, who acknowledges the receipt of the goods and promises to deliver them in good condition at the place directed, dangers of the sea excepted. Bills of lading can be transferred by endorsement; the endorsement transfers all rights and liabilities under the bill of lading of the original holder or consignee.

*Bill of Sale*, a formal instrument for the conveyance or transfer of personal chattels, as household furniture, stock in a shop, shares of a ship. It is often given to a creditor in security for money borrowed, or obligation otherwise incurred, empowering the receiver to sell the goods if the money is not repaid with interest at the appointed time or the obligation not otherwise discharged; in this case commonly called, in the United States, a chattel mortgage.

**Billaud-Varenne** (bi-y ō-vȧ-ren), JACQUES NICOLAS, a noted French revolutionist, was born at Rochelle in 1756; died in Haiti in 1819; he bore a principal part in the murders and massacres which followed the destruction of the Bastille; voted immediate death to Louis XVI; and eventually assisted in bringing about the fall of Robespierre. In 1795, on a reaction having taken place against the ultra party, he was arrested and banished to Cayenne.

**Bill Broker**, a financial agent or money-dealer, who discounts or negotiates bills of exchange, promissory-notes, etc.

**Bill-chamber**, a department of the Court of Session in Scotland, in which one of the judges officiates at all times during session and vacation. All proceedings for summary remedies, or for protection against impending proceedings, commence in the bill-chamber, such as interdicts. The process of sequestration or bankruptcy also issues from this department.

**Bil'leting**, a mode of feeding and lodging soldiers when they are not in camp or barracks by quartering them on the inhabitants of a town. The necessity for billeting occurs chiefly during movements of the troops or when any accidental occasion arises for quartering soldiers in the town which has not sufficient barrack accommodation.

**Billet-molding**, an ornament common in Norman architecture, consisting of an imitation of billets, or round pieces of wood, placed in a hollow molding with an interval between each two usually equal to their own length.

**Bill-fish**, the gar-pike or long-nosed gar (*Lepidostĕus osseus*), a fish common in the lakes and rivers of the United States; but the name is also given to other fishes.

**Bill-hook.** See *Bill* (cutting instrument).

**Billiards** (bil'yĕrdz), a well-known game, probably (like its name) of French origin, played with ivory balls on a flat table. Various modes of play, constituting many distinct games, are adopted, according to the tastes of the players, some being more in favor in one country, some in another. The standard American table is of oblong shape 5 by 10 feet, though more commonly the size is 4½ by 9 feet. In England the table is 6 by 12 and has six holes at the corners and sides called pockets. In the French table, the kind now commonly used in America, there are no pockets. Each player is provided with a *cue* to strike the balls. The cue is a wooden rod from 4 or 5 to 6 or 8 feet long, rounded in form, and tapering gradually from 1¼ inches in diameter at the butt to ¾ inch or less at the point, which is tipped with leather and rubbed with chalk to make the stroke smooth. In the three-ball game two players engage. Each has a white ball, and a red ball is common to the two. This was called *caram bole* in French and became *cannon* in England, and *carom* in the United States. When the game has commenced the player is at liberty to strike at either his opponent's ball or the red, and continues to play as long as he succeeds in scoring. The whole of an uninterrupted run of play is called a *break*. In the four-ball game it is much easier to make points, the larger number of balls offering more opportunities for successful caroms. There are many rules connected with the game which must be omitted here. By "nursing" the balls, keeping them together near the cushions, extraordinary runs have been made by billiard experts. Scores of 500 and more

points are on record. After the ordinary game the most favorite varieties are *pyramids* and *pool*. These are played on pocket tables. The former is so called from the position in which the balls are placed at the beginning of the game. It is played with fifteen balls; and the object of the players is to try who will pocket, or 'pot,' the greatest number of balls. This corresponds largely to the American form of pool. Pool is also a game of 'potting,' but is played somewhat differently. It is a favorite game with those who play for stakes, and may be considered an English variant of billiards. It embraces an indefinite number of players, each of whom is provided with a ball of a different color from any of the others. They play in succession, and each tries to pot his opponent's ball. If he succeeds with one he goes on to the next; if he fails another player takes his turn, playing first on the ball of the last player. There are thus two points which a pool-player has to aim at: to pot as many balls as possible, and to keep his ball in a safe position relatively to that of the following player, as the player whose ball is potted has to pay the prescribed penalty.

**Billings** (bil'ings), a city, county seat of Yellowstone Co., Montana, on the Yellowstone River. Farming and stock raising are the chief industries. Pop. 13,500.

**Billings,** JOHN SHAW, noted American surgeon and writer on medicine and hygiene, born 1839; died 1913. He served during the Civil war, and was promoted to rank of lieutenant-colonel for distinguished conduct.

**Billings,** JOSH, pseudonym of Henry Wheeler Shaw, the American humorist (*q. v.*).

**Billings,** WILLIAM, American musical composer, born in Boston, Mass., 1746. He was a tanner by trade, educated himself to be a teacher and is said to be the first American composer. He revolutionized American church music by his works, which include *The New England Psalm-Singer* (1770), *The Singing Master's Assistant* (1778). He also wrote a number of patriotic pieces during the Revolution, which enjoyed great favor among the troops. Died 1800.

**Billingsgate** (bil'ingz-gāt), the principal fish-market of London, on the left bank of the Thames, a little below London Bridge. From the character, real or supposed, of the Billingsgate fish-dealers, the term *Billingsgate* is applied generally to coarse and violent language.

**Billington** (bil'ing-tun), ELIZABETH, English singer, born about 1768 in London, died in Italy in 1818. Bianchi composed the opera of *Inez de Castro* expressly for her performance at Naples. She retired from the stage in 1811.

**Billiton,** or BLITOENG (blē-tong'), a Dutch East Indian island between Banca and the S. W. of Borneo, of an irregular subquadrangular form, area 1773 sq. miles. It exports sago, cocoanuts, pepper, tortoise-shell, trepang, edible bird's-nests, etc. Its tin deposits are of much importance. It was ceded to the British in 1812 by the Sultan of Palembang, but in 1824 it was given up to the Dutch. Pop. about 42,000.

**Billroth** (bil'rōt), ALBERT CHRISTIAN THEODOR, a noted Austrian surgeon, of Swedish origin, was born at Bergen in 1829. He filled the chair of surgery at Zürich from 1860 to 1867 and in the latter year accepted the professorship of surgery at Vienna, where the remainder of his professional life was spent. As an author his principal work was *Allgemeine Chirurgische Pathologie und Therapie* (1863). He died in 1894.

**Bilney,** THOMAS, an English martyr, born probably about 1495; burnt at the stake in London, August 19, 1531. While to the last in all essential points he remained an orthodox Roman Catholic, he fell under the displeasure of Wolsey, and was convicted of heresy. He was given an opportunity to recant, which he did, but later, overcome by remorse for his apostasy, he resumed his preaching, now in the open fields. He was again tried, degraded from his orders, and handed over to the civil authorities for execution.

**Biloxi** (be-lox'ē), a city of Mississippi, on the Gulf of Mexico, with shipyards, canneries, and a large trade. Was settled by French in 1699 and was first capital of Louisiana Territory. Pop. 7988.

**Biloxi,** a small Indian tribe inhabiting Louisiana, thought to belong to the Choctaws, but proved to belong to the Sioux.

**Bilston** (bil'stun), a town of England, in Staffordshire, forming part of the parlimentary borough of Wolverhampton; it has extensive manufactories of hardware. Pop. (1911) 25,681.

**Bimetallism** (bī-met'al-izm), that system of coinage which recognizes coins of two metals (silver and gold) as legal tender to any amount; or in other words, the concurrent use of coins of two metals as a circulating medium, the ratio of value between the two being arbitrarily fixed by law. It is contended by advocates of the system that by fixing a legal ratio between the value of gold and silver, and using both as

legal tender, fluctuations in the value of the metals are avoided, while the prices of commodities are rendered steadier. The system of bimetallism has been set aside in most commercial countries in favor of a single gold standard. The United States has been one of the latest countries to adopt this. After the election of 1900 bimetallism passed from view, and the silver issue was withdrawn from the Democratic platform in 1904.

**Bimlipatam** (bim-li-pâ-tâm'), a seaport of India, Madras Presidency, with a brisk trade. Pop. 10,212.

**Binalonan,** a town in Luzon, Philippine Islands, in Pangasinan province. Pop. 10,295.

**Binan** (bē-nyän'), a town of the province of La Laguna, Luzon, Philippine Islands, in a rice and timber producing country. Pop. 9563.

**Binary** (bī'na-ri), twofold; double.—*Binary compound*, in chemistry, a compound of two elements, or of an element and a compound performing the function of an element, or of two compounds performing the function of elements, according to the laws of combination.—*Binary theory of salts*, the theory which regarded all salts as being made up of two oxides, an acid oxide and a basic oxide; thus sodium carbonate as made up of soda ($Na_2O$) and carbon dioxide ($CO_2$).—*Binary star*, a double star whose members revolve round a common center of gravity.

**Binche** (banṣh), a town of Belgium prov. Hainaut, with manufactures of lace, pottery, etc. Pop. 12,500.

**Bindrabund.** See *Brindaban.*

**Bindweed,** the common name for plants of the genus *Convolvŭlus*, especially of *C. arvensis*, and also of plants of the allied genus *Calystegia*, especially *C. soldanella* and *C. sepium*. The black bryony is called *black bindweed;* smilax is called *rough bindweed. Solānum dulcamāra* (the bittersweet) is the *blue bindweed* of Ben Jonson.

**Bingen,** a town of Germany, in Hesse-Darmstadt, on the left bank of the Rhine, in a district producing excellent wines. The Mäusethurm or Mouse-tower in the middle of the river is the scene of the well-known legend of Bishop Hatto. Pop. (1905) 9950.

**Bingham** (bing'am), JOHN A., lawyer and legislator, born in Pennsylvania in 1815; died in 1900. Admitted to the bar in 1840, elected to Congress in 1854, and re-elected for several terms, serving 16 years. He was distinguished as a debater. In 1868 he, with Thaddeus Stevens, were made a committee to impeach Andrew Johnson, President of the United States, and was chairman of the managers who conducted the impeachment trial.

**Bingham,** JOSEPH, an English writer, born in 1668; died in 1723; distinguished himself as a student at Oxford, and devoted his attention particularly to ecclesiastical antiquities. He was compelled to leave the university for alleged heterodoxy, but was presented to the living of Headbournworthy, near Winchester, and afterwards to that of Havant, near Portsmouth. His great work, *Origines Ecclesiasticæ*, or *Antiquities of the Christian Church*, in 10 vols., was published 1708–1722.

**Binghamton** (bing'am-ton), a city, county seat of Broome county, N. Y., at the junction of the Chenango and Susquehanna rivers, 215 miles N. W. of New York city. It is the seat of several collegiate institutions, of the State Hospital for the Insane, and homes for orphan children. There is also a state armory. It has an extensive trade, and many important manufactures, cigar-making being a leading industry. It receives its name from William Bingham, once the owner of its site. He was a member of the Continental Congress, 1787–88 and of the United States Senate, 1795–1801. Binghamton lies in a butter and cheese-making district. Pop. 48,443.

**Bingley,** a market town, W. Riding of Yorkshire, 15 miles W. N. W. of Leeds, with considerable manufactures of worsted, cotton, paper, and iron. Pop. 18,759.

**Binmaley,** a Philippine town in the province of Pangasinan, Luzon, on the delta of the river Agno. It is the northern terminus of the Manila and Dagupan railway. Fisheries, pottery, salt manufacture, roofing made of Nipa leaves, and nipa wine are its industries. Pop. 16,439.

**Binnacle** (bin'a-kl), a case or box on the deck of a vessel near the steering apparatus, containing the compass and lights by which it can be read at night.

**Binney,** HORACE, born in Philadelphia in 1780; died in 1875; was a prominent lawyer, for many years leader of the Pennsylvania bar. He was a member of Congress from 1833 to 1835.

**Binney,** THOMAS, a popular independent preacher, theologian, and controversialist, born at Newcastle-on-Tyne 1798; died 1874; a voluminous writer.

**Binocular** (bī-nok'ū-lar), a field-glass or opera-glass, or a microscope suited for viewing objects with both eyes at once.

**Binomial** (bī-nō'mi-al), in algebra, a quantity consisting of two terms or members, connected by the sign + or —. The *binomial theorem*, is the celebrated theorem given by Sir Isaac Newton for raising a binomial to any power, or for extracting any root of it by an approximating infinite series.

**Bintang,** an island of the Dutch East Indies, at the S. extremity of the Malay Peninsula; area 450 sq. miles; yields catechu and pepper. Pop. 18,000.

**Binturong** (bin'tur-ong; *Arctictis binturong*), a carnivorous animal of the civet family, with a prehensile tail, a native of India and the Eastern Archipelago.

**Binue** (bin'ụ-e). See *Benue.*

**Bio-Bio** (bē'o-bē'o), the largest Chilean river, rises in the Andes, flows in a N. W. direction for about 225 miles, and falls into the Pacific at the city of Concepción. It gives name to a province of the country, with nearly 100,000 inhabitants; area 5246 sq. miles.

**Biogenesis** (bī-o-jèn'e-sis), the history of life development generally; specifically, that department of biological science which speculates on the mode by which new species have been introduced; properly restricted to that view which holds that living organisms can spring only from living parents.

**Biography** (bī-og'ra-fi), that department of literature which treats of the individual lives of men or women; and also, a prose narrative detailing the history and unfolding the character of an individual written by another. When written by the individual whose history is told it is called an *autobiography*. This species of writing is as old as literature itself. In the first century after Christ Plutarch wrote his *Parallel Lives;* Cornelius Nepos, the *Lives of Military Commanders;* and Suetonius, the *Lives of the Twelve Cæsars.* Modern biographical literature may be said to date from the seventeenth century, with Izaak Walton, since which time individual biographies have multiplied enormously. Dictionaries of biography have proved extremely useful, Bayle's *Dictionnarie Historique et Critique*, 1696, being perhaps the first of this class. During the nineteenth century were published the *Biographie Universelle*, 85 vols., 1811–62; *Nouvelle Biographie Générale*, 46 vols., 1852–66; Chalmers's *General Biographical Dictionary*, 32 vols., 1812–17; Lippincott's *Biographical Dictionary;* Leslie Stephen's *Dictionary of National Biography* completed in 63 volumes, the first of which appeared in January, 1885; and Appleton's *Cyclopædia of American Biography*, (1888), with many other less voluminous examples.

**Biology** (bī-ol'o-ji), a comprehensive term for those departments of science that treat of living beings, including under this head both animals and plants. It therefore comprehends both botany and zoology in all their branches and details.

**Bion** (bīon), an ancient Greek pastoral poet born in Smyrna, or in its neighborhood; flourished about 100 B.C. He wrote bucolic and erotic poems, fragments of which are extant. He is supposed to have spent the last years of his life in Sicily, where he was poisoned.

**Bion,** Greek philosopher, flourished in the first half of the 3d century. He taught philosophy at Rhodes, and died at Chalcis. He was a popular writer and appealed to the sympathies of the lower classes. Specimens of his apothegms may be found in Diogenes Laertius.

**Biot** (bē-ō), JEAN BAPTISTE, a French mathematician and physicist, born at Paris in 1774; died there in 1862. He became professor of physics in the Collège de France in 1800, in 1803 member of the Academy of Sciences. He is especially celebrated as the discoverer of the circular polarization of light. Besides numerous memoirs contributed to the Academy and to scientific journals, he wrote *Essai de Géométrie Analytique; Traité de Physique Experimentale et Mathématique;* and *Traité Elémentaire de Physique Expérimentale* as well as works on the astronomy of the ancient Egyptians, Indians, and Chinese.—His son, EDOUARD CONSTANT, was an eminent Chinese scholar.

**Biplane** (bī'plān), a flying machine composed of two gliding planes connected by upright stays, the operator and machinery being on the lower plane. See *Aeroplane.*

**Bipont** (or BIPONTINE) EDITIONS, famous editions of the classic authors, printed at Zweibrücken (Fr. *Deux Ponts*, L. *Bipontium*), in the Rhenish Palatinate. The collection forms 50 vols., begun in 1779. It was finished at Strasburg.

**Biquadratic** (bī-quad-rat'ik) EQUATION, in algebra, an equation raised to the fourth power or where the unknown quantity of one of the terms has four dimensions. An equation of this kind when complete is of the form $x^4+Ax^3+Bx^2+Cx+D=0$, *where* A, B, C, and D denote any known quantities whatever.

**Bir,** or BIREH-JIK, a town of Asiatic Turkey, 62 miles N. E. Aleppo, on

the Euphrates, at the point where the great caravan route from Syria to Bagdad crosses the river. Pop. est. over 10,000.

**Birbhum,** or BEERBHOOM (bĕr'b'hŏm), a district of British India, in the Bardwân division of Bengal; area, 1756 sq. miles. Chief manufactures, silk and lacquered wares. Pop. 902,280.

**Birch** (*Betŭla*), a genus of trees, order *Betulaceæ*, which comprises only the birches and alders, which inhabit Europe, Northern Asia, and North America. The common birch is indigenous throughout the north, and on high situations in the south of Europe. It is extremely hardy, and no other species of trees approach so near to the north pole. It is the only tree found in Greenland. The white, gray or poplar birch, *B. alba*, is the principal European species. The wood of this tree, which is light in color and firm and tough in texture, is used for chairs, tables, bedsteads, and the woodwork of furniture generally, also for fish-casks and hoops, and for smoking hams and herrings, as well as for many small articles. In Russia the oil extracted from it is used in the preparation of Russian leather, to which it imparts its well-known scent. The sap, from the amount of sugar it contains, affords a kind of agreeable wine, which is produced by the tree being tapped in the warm weather of spring, when the sap runs most copiously. Dried, ground and mixed with meal, birch bark is used in Norway for feeding swine; and in times of scarcity it has served for bread. The North American species are several and all of value. The canoe or paper-birch, *B. papyrifera*, is a large tree with tough, durable bark, largely used by the Indians in the manufacture of canoes and lodges. The yellow birch, *B. lutea*, so named from its beautiful bark of golden yellow color, grows to a large size and is much valued, its wood being heavy, strong and hard. The black, sweet, cherry- or mahogany-birch, *B. lenta*, has a spicy, aromatic bark, yielding a volatile oil identical with oil of wintergreen, and its heavy, dark-colored wood is largely used in cabinet work. Other species are the red or river-birch, *B. nigra*, of the Southern States, and *B. occidentales*, found in the Rocky Mountains and farther west. Several shrubby species are distributed through alpine and arctic regions, as the alpine birch, *B. nana*, the low or dwarf birch, *B. pumila*, and the scrub birch, *B. glandulosa*.—BIRCH BEER is an artificial non-fermented sweet liquid of a wine-red color, flavored with birch.

**Birch,** SAMUEL, orientalist, born in London in 1813; died in 1885. He entered the British Museum as assistant keeper of antiquities in 1836, and ultimately became keeper of the Egyptian and Assyrian antiquities. He was specially famed for his capacity and skill in Egyptology, and was associated with Baron Bunsen in his work on Egypt, contributing the philological portions relating to hieroglyphics. His principal works, besides numerous contributions to the transactions of learned societies, to encyclopædias, etc., include *Gallery of Antiquities*, 1842; *Introduction to the Study of Hieroglyphics*, 1857; *Egypt from the Earliest Times*, 1875, and others.

**Birch,** THOMAS, an industrious historian and biographer, born in London in 1705; killed by a fall from his horse in 1766. He took orders in the church in 1730, and obtained in 1732 a living in Essex. In 1734 he engaged with others in writing the *General Historical and Critical Dictionary*, founded on that of Bayle, and completed, in ten vols. fol., in 1741. He subsequently obtained various preferments in the church.

**Birch,** THOMAS, American painter, born in London, England, 1779; died at Philadelphia, Pa., 1851. He confined himself to portrait painting until 1807, when he took up marine painting, achieving a high reputation in that field. Several of his works represent naval battles of the war of 1812, notably the engagement between the ship *United States* and the *Macedonian*, and that between the *Constitution* and the *Guerrière*. Both these are in the Harrison collection at Philadelphia.

**Birch-Pfeiffer** (birh-pfī'fr), CHARLOTTE, a German dramatist and actress, born in Stuttgart in 1800; died at Berlin in 1868. She married Dr. Birch of Copenhagen in 1825, and obtained great success as a performer and author. She was for some years manager of the Zürich theater, and latterly of the Hoftheater in Berlin. She wrote several novels and some seventy plays.—Her daughter, WILHELMINE VON HILLERN (born 1836) is well known as a writer of novels.

**Bird,** EDWARD, an English painter, born at Wolverhampton in 1772; died at Bristol in 1819. He became an academician in 1815. He excelled in historical and genre subjects. Among his chief pictures are the *Death of Eli*, and *Field of Chevy Chase, After the Battle*.

**Bird,** ROBERT MONTGOMERY, author, born at New Castle, Delaware, in 1803; died in 1854. He became a doctor in Philadelphia, wrote for Edwin Forrest the tragedy *The Gladiator;* also *Ora loosa*, published *Calaver*, a romance of Mexico and other novels, and in 1847 be-

came joint editor and publisher of the *North American and United States Gazette*.—His son FREDERICK M. BIRD, born 1838; died 1908, became professor of psychology in Lehigh University in 1881, and edited *Lippincott's Magazine* 1893–99.

**Bird-bolt,** a short, thick, blunt arrow for shooting at birds from a crossbow.

**Birdcall,** an instrument for imitating the cry of birds in order to attract them so that they may be caught.

**Bird-catching Spider,** a name applied to gigantic spiders of the genera *Mygăle* and *Epeira*, more especially to the *Mygăle avicularia*, a native of Surinam and elsewhere which preys upon insects and small birds which it hunts for and pounces on. It is about two inches long, very hairy, and almost black; its feet when spread out occupy a surface of nearly a foot in diameter.

**Bird-cherry,** a species of cherry (*Prunus padus*), a very ornamental tree in shrubberies from its purple bark, its bunches of white flowers, and its berries, which are successively green, red, and black. Its fruit is nauseous to the taste, but is greedily eaten by birds. The wood is much used for cabinet-work. It is common in the native woods of Sweden and Scotland.

**Bird-lime,** a viscous substance used for entangling birds so as to make them easily caught, twigs being for this purpose smeared with it at places where birds resort. It is often prepared from holly-bark, being extracted by boiling.

**Bird of Paradise,** the name for members of a family of birds (*Paradiseidæ*) of splendid plumage, allied to the crows, inhabiting New Guinea and the adjacent islands. Among the most striking of these birds are the great bird of paradise, *Paradisea apoda*, the one most often found in collection; the king paradise bird, *Cincinnurus regius*, a highly ornamented species; the rifleman or rifle-bird, *Ptilorhis paradisea*; the magnificent bird of paradise, *Diphyllodes magnifica*, characterized by an erectile ruff; the superb bird of paradise, *Lophorina atra*, a rare species. The feathers of the *P. major* and *P. minor* are those chiefly worn in plumes. These splendid ornaments are confined to the male bird.

**Birds.** See *Ornithology*.

**Bird-seed,** seed for feeding cage-birds, especially the seed of *Phalăris canariensis*, or canary-grass.

**Bird's-eye,** a name of germander speedwell (*Veronica chamædrys*. Also a species of primrose, *Primula farinosa*.

**Bird's-eye Limestone,** a division of the Lower Silurian rocks of North America, apparently equivalent to the Llandeilo Beds, so called from the dark circular markings which stud many portions of its mass, which have been referred to the remains of brachiopods.

**Bird's-eye Maple,** curled maple, the wood of the sugar-maple when full of little knotty spots somewhat resembling birds' eyes, much used in cabinet-work.

**Bird's-eye View,** the representation of any scene as it would appear if seen from a considerable elevation right above.

**Bird's-foot,** a common name for several plants, especially papilionaceous plants of the genus *Ornithŏpus*, their legumes being articulated, cylindrical, and bent in like a claw.

**Bird's-foot Trefoil,** the popular name of *Lotus corniculātus*, and one or two other creeping leguminous plants common in Britain. The ordinary bird's-foot trefoil is a common British plant, and is found in most parts of Europe as well as in Asia, North Africa and Australia, and is a useful pasture-plant.

**Bird's-nest,** a name popularly given to several plants, as *Neottia nidus-avis*, a British orchid found in beech woods; so called from the mass of interlaced fibers which form its roots. *Monotrŏpa hypopitys*, a parasitic ericaceous plant growing on the roots of trees in fir woods, the leafless stalks of which resemble a nest of sticks; and *Asplenium nidus*, from the manner in which the fronds grow, leaving a nest-like hollow in the center.

**Birds'-nests,** EDIBLE, the nests of the salangane (*Collocălia funciphăga*) and other species of swifts (or swiftlets) found in the Indian seas. They are particularly abundant in the larger islands of the Eastern Archipelago. The nest has the shape of a common swallow's nest, is found in caves, particularly on the seashore, and has the appearance of fibrous, imperfectly concocted isinglass. When procured before the eggs are laid the nests are of a waxy whiteness and are then esteemed most valuable; when the bird has laid her eggs they are of second quality; when the young are fledged and flown the old nest is destroyed by the nest gatherers, to promote the construction of new nests. They appear to be composed of a mucilaginous substance

are then esteemed most valuable; when the bird has laid her eggs they are of second quality; when the young are fledged and flown, of third quality. They appear to be composed of a mucilaginous substance secreted by special glands, and not, as was formerly thought, made from a glutinous marine fucus or sea-weed. The Chinese consider the nests as a great stimulant and tonic, and it is said that about 8½ millions of them are annually imported into Canton.

**Birds of Passage,** birds which migrate with the season from a colder to a warmer, or from a warmer to a colder climate, divided into *summer birds of passage* and *winter birds of passage.* Such birds always breed in the country to which they resort in summer, *i. e.,* in the colder of their homes. Among European summer birds of passage are the cuckoo, swallow, etc. In America the robin is a familiar example. See *Migration of Animals.*

**Birds of Prey,** the Accipiters or Raptores, including vultures, eagles, hawks or falcons, buzzards, and owls.

**Bird-Spider.** See *Bird-catching Spider.*

**Bireme** (bī'rēm), an ancient vessel with two banks or tiers of oars; *trireme,* one with three tiers; *quadrireme,* one with four; *quinquereme,* one with five.

**Biren** (bē'ren), or BI'RON, ERNEST JOHN VON, Duke of Courland, born in 1687; died 1772; was the son of a landed proprietor. He gained the favor of Anna, Duchess of Courland and niece of Peter the Great of Russia, and when she ascended the Russian throne (1730) Biren was loaded by her with honors, and introduced at the Russian court. He was made Duke of Courland in 1737, and continued a powerful favorite during her reign, freely indulging his hatred against the rivals of his ambition. He caused 11,000 persons to be put to death, and double that number to be exiled. On the death of Anna he became regent, but he was exiled to Siberia in 1741. On the accession of Elizabeth to the throne she permitted his return to Russia, and in 1763 the duchy of Courland was restored to him.

**Biretta,** BIRRETTA, BERET'TA (biret'a), an ecclesiastical cap of a square shape with stiff sides and a tassel at top, usually black for priests, violet for bishops, and scarlet for cardinals.

**Birkbeck** (birk'bek), GEORGE, the founder of mechanics' institutes, born at Settle, Yorkshire, in 1776; died at London in 1841. He studied medicine at Edinburgh; was appointed to the chair of natural and experimental philosophy in the Andersonian Institute at Glasgow in 1799, where he successfully established a class for mechanics. In 1806 he settled as a physician in London, and in 1822 founded the London Mechanics' Institute, now known as the Birkbeck Literary and Scientific Institution.

**Birkenfeld** (bir'ken-felt), an outlying principality belonging to Oldenburg, surrounded by the Rhenish districts of Coblentz and Treves; area 312 sq. m.; pop. 43,409. It has a market town of the same name.

**Birkenhead** (bir'ken-hed), a borough of England, in Cheshire, on the estuary of the Mersey, opposite Liverpool. It has commodious docks with a lineal quay space of over 9 miles, and a complete system of railway communication for the shipment of goods and direct coaling of steamers. The principal industries are shipbuilding and engineering. Its commerce is in all respects a branch of that of Liverpool. The communication with Liverpool is by large steamboats and by a railway tunnel under the bed of the Mersey 4½ miles long including the approaches, 21 feet high, 26 feet wide, the roof being about 30 feet below the bed of the river; cost $6,250,000. Pop. (1911), 130,832.

**Birmingham** (bir'ming-ham), a city, capital of Jefferson county, Alabama, and the most important seat of the iron industry in the South, is 95 miles N. N. W. of Montgomery, and in the center of an important coal and iron-mining region. Iron Mountain, 6 miles distant, contains very rich hematite deposits. The city has numerous blast furnaces, rolling mills, steel works, etc., and its population increased from 3000 in 1880 to 38,415 in 1900 and 132,685 in 1910.

**Birmingham,** a great manufacturing city of England, situated on the small river Rea near its confluence with the Tame, in the N. W. of Warwickshire, with suburbs extending into Staffordshire and Worcestershire; 112 m. N. W. of London, and 97 S. E. of Liverpool. It is the principal seat of the hardware manufacture in Britain, producing metal articles of all kinds from pins to steam-engines. It manufactures firearms in great quantities, swords, jewelry, buttons, tools, steel pens, locks, lamps, bedsteads, gas-fittings, sewing-machines, articles of papier-maché, railway-carriages, etc. The quantity of solid

gold and silver plate manufactured is large. Electroplating, first established in 1841, is one of the leading trades. Japanning, glass manufacturing, and glass-staining or painting form important branches of industry, as also does the manufacture of chemicals. At Soho in the vicinity of the town are the famous works founded by Matthew Boulton and James Watt, who there manufactured their first steam-engines, and where gas was first used, plating perfected, and numerous novel applications tried and experiments made. Among the public buildings are the Town Hall, a handsome building of the classic style, the Free Library (of which the central part was burned in 1879, when the irreplaceable Shakespeare library, and the collection of books, prints, etc., bearing on the antiquities of Warwickshire, were destroyed), the Midland Institute and Public Art Gallery, the Council House, etc. The finest ecclesiastical building is the Roman Catholic cathedral, designed by Pugin. The principal educational establishments are Queen's College, and the Mason Scientific College, merged in Birmingham University, 1898–1900; the Free Grammar School; and a school of art and design. Birmingham is known to have existed in the reign of Alfred, in 872, and is mentioned in the Domesday Book (1086) by the name of *Bermingeham*. Another old name of the town is *Bromwycham*, a form still preserved very nearly in the local pronunciation *Brummagem*. It became a city by royal grant in 1888. The population is (1911) 525,960.

**Birnam,** a hill in Perthshire, Scotland, 1324 feet high, once covered by the royal forest immortalized by Shakespeare in *Macbeth*.

**Birney,** JAMES G., abolitionist, was born in Kentucky in 1792; died in 1857. In 1834 he emancipated his slaves and advocated the abolition of slavery. Settling in Cincinnati, he edited *The Philanthropist*, its office being mobbed several times and finally destroyed. In 1840 and 1844 he was candidate of the Liberty party for president, his candidacy (1844) depriving Henry Clay of the electoral votes of New York and Michigan, thereby electing Polk.

**Birrell** (bir'el), AUGUSTINE, an English author and statesman, born near Liverpool 1850; member of Parliament 1889–1906; professor of law in University College, London, 1896-99; Chief Secretary for Ireland, 1907-16. His writings include *Obiter Dicta*, *Life of Charlotte Brontë*, *Res Judicatæ*, and other works.

**Birsk,** a town in Orenburg government, Russia; founded in the 16th century as an outpost against Bashkir invasion. Pop. 9000.

**Birs Nimrud,** a famous mound in Babylonia, on the west side of the Euphrates, 6 miles S. W. of Hillah, generally regarded as the remains of the Biblical Tower of Babel.

**Birstal,** a mining and manufacturing town of Yorkshire, England. It has woolen mills. Pop. 7117.

**Birth,** or LABOR, in physiology, is the act by which a female of the class *Mammalia* brings one of her own species into the world. When the fœtus has remained its due time in the womb, and is in a condition to carry on a separate existence, it is extruded from its place of confinement, in order to live the life which belongs to its species, independently of the mother. The period of gestation is very different in different animals, but in each particular species it is fixed with much precision. At the end of the thirty-ninth or the beginning of the fortieth week the human child has reached its perfect state, and is capable of living separate from the mother; hence follows in course its separation from her; that is, the birth. Contractions of the womb gradually come on, which are called, from the painful sensations accompanying them, *labor-pains*. The contractions of the womb take place in the same order as the enlargement had previously done, the upper part of it first contracting, while the mouth of the womb enlarges and grows thin, and the vagina becomes loose and distensible. By this means the fœtus, as the space within the womb is gradually narrowed, descends with a turning motion towards the opening, and some time after the head of the child appears and the rest of the body soon follows. An *artificial* birth is that which is accomplished by the help of art, with instruments or the hands of the attendant. *Premature* birth is one which happens some weeks before the usual time; namely, after the seventh and before the end of the ninth month. Abortion and miscarriage take place when a fœtus is brought forth so immature that it cannot live. They happen from the beginning of pregnancy to the seventh month, but most frequently in the third month. Abortion is the term given to premature expulsion before the third month of gestation, miscarriage from the third to the seventh month.

**Birth Mark.** See *Nævus*.

**Birthright,** any right or privilege to which a person is entitled by birth, such as an estate descendible by law to an heir or civil liberty under a free constitution. See *Primogeniture*.

**Birthroot,** a name of *Trillium erectum* and other American plants of the same genus, having roots said to be astringent, tonic, expectorant, and antiseptic.

**Birthwort** (*Aristolochia clematitis*), a European shrub so called from the supposed services of its root when used medicinally in parturition.

**Bisaccia** (bē-sȧch'ȧ), an Italian town, prov. of Avellino, 30 m. E. N. E. of Avellino in the Apennines. Pop. 7439.

**Bisacquino** (bis-ak-kwē'nō), a town of Sicily, prov. Palermo. Pop. 9016.

**Bisalnagar** (bis-al-nȧg'ȧr), a town of India, 120 miles N. N. W. of Baroda, has manufacturers of cotton and a transit trade. Pop. 20,000.

**Bisalpur** (bē-sal-pör'), a town of India, N. W. Provinces, 24 m. east of Bareli. Pop. 10,000.

**Bisbee,** a city in Arizona, Cochise county. Copper mining and smelting are the main industries. Pop. (1910) 9019.

**Biscay** (bis'kā; Spanish *Viscaya*), a province of Spain near its northeast corner, one of the three Basque provinces (the other two being Alava and Guipuzcoa), area 836 sq. miles. The surface is generally mountainous; the most important mineral is iron, which is extensively worked; capital Bilbao. Pop. 348,684.

**Biscay,** Bay of, that part of the Atlantic which lies between the projecting coasts of France and Spain, extending from Ushant to Cape Finisterre, celebrated for its dangerous navigation.

**Bisceglie** (bē-shel'yā), a seaport of Italy, province of Bari, on the W. shore of the Adriatic, containing a 12th century cathedral and ruins of an old Norman castle. The neighborhood produces good wine and excellent currants. Pop. 30,885.

**Bischof** (bish'of), Karl Gustav, German chemist and geologist, born at Nürnberg in 1792; died at Bonn in 1870. He was appointed professor of chemistry at Bonn in 1822. He published in London, 1841, *Researches on the Internal Heat of the Globe* (in English); but his chief work is the *Lehrbuch der chemischen und physikalischen Geologie,* 1847–54.

**Bischoff** (bish'of), Theodor Ludwig Wilhelm, German anatomist and physiologist, born in Hanover in 1807; died at Munich in 1882. He became professor of comparative and pathological anatomy at Heidelberg in 1836; of anatomy at Giessen in 1844; and from 1855 to 1878 he occupied the chair at Munich. He was the author of several treatises, and gained distinction by his researches in embryology.

**Bischweiler** (bish'vī-lėr), a town of Germany, Alsace-Lorraine, 12 miles N. of Strasburg, on the Moder, with flourishing manufactures of cloth. A great hop market is held there in the autumn. Pop. (1910) 8145.

**Bischofswerda,** a town of Germany in the kingdom of Saxony, governmental district of Bantzen. There are a number of manufacturing industries, and in the neighborhood extensive granite quarries. Scene of a battle on May 12, 1813, between the French and the Allies, after Napoleon's retreat from Moscow. Pop. 7465.

**Biscuit** (bis'kėt; Fr. 'twice-baked'), a kind of hard, dry bread which is not liable to spoil when kept. More than a hundred different sorts of biscuit are manufactured, and owing to the immense demand manual labor has long since been superseded in the larger works by machinery. In making sea-biscuit the flour is mixed with water, converted into dough, kneaded with rollers, cut, stamped, conveyed on a framework drawn by chains through an oven open at both ends, and thence passed to a drying room—all without being touched by hand. In many fancy biscuits the process is of course more elaborate, but even in these machinery plays an important part. *Meat biscuits* are made of flour mixed with the soluble elements of meat.

**Biscuit,** in pottery, a term applied to porcelain and other earthenware after the first firing and before glazing. At this stage it is porous and used for wine-coolers, etc.

**Bise** (bēz), a keen northerly wind prevalent in the north of the Mediterranean.

**Bisharin** (bi-shȧ-rēn'), a race inhabiting Nubia, between the Nile and the Red Sea, somewhat resembling the Bedouins, and living by pasturage. They are Mohammedans by religion, yet are said to preserve traces of animal worship. Linguistically and geographically they form a connecting link between the Hamitic populations and the Egyptians.

**Bishnupur** (bish-nu-pör'), a town of India, Bankurȧ district of Bengal, with manufactures of cottons and fine silk cloth and a brisk trade. Pop. about 18,000.

**Bishop,** the highest of the three orders in the Christian ministry—bishops, priests, and deacons—in such churches as recognize three grades. The name is derived from the Greek *episkopos,*

meaning literally an overseer, through the A. Saxon *biscop, biscoop*. Originally in the Christian church, the name was used interchangeably with *presbyter* or *elder* for the overseer or pastor of a congregation; but at a comparatively already period a position of special authority was held by the pastors of the Christian communities belonging to certain places, and the name of bishop became limited to these by way of distinction. There is much that is doubtful or disputed in regard to the history of the episcopal office. Roman Catholics and many others hold that it is of divine ordination and existed already in apostolic times; and they maintain the doctrine of the apostolical succession; that is to say, the doctrine or the transmission of the ministerial authority in uninterrupted succession from Christ to the apostles, and through these from one bishop to another. Presbyterians deny that the office was of divine or apostolic origin, and hold that it was an upgrowth of subsequent times easily accounted for, certain of the presbyters or pastors acquiring precedence as bishops over others, just as the bishops of the chief cities (Jerusalem, Antioch, Alexandria, Constantinople, Rome) obtained precedence among the bishops and received the title of metropolitan bishops; while the bishop of Rome came to be regarded as the head of the church and the true successor of Peter. According to Cyprian, bishops were in the earliest times chosen by the people, subject to a veto by the bishops of the province. In the year 325 the first Nicene Council recommended appointment by the provincial bishops subject to confirmation of their choice by the metropolitan. In the 11th century the right of election passed to the cathedral chapter, and the pope gradually engrossed the sole right of confirmation, until finally Clement V and his successors claimed the right absolutely. At present in the Roman Catholic Church the bishop is usually selected by the pope from a number of priests whose names have been submitted by the chapter connected with the cathedral church. When the monarch is Roman Catholic a bishopric may be in the royal gift, subject to papal approval. The bishop comes next in rank to the cardinal. His special insignia are the mitre and crosier or pastoral staff, a jeweled ring, the pectoral cross, etc. He guards the purity of doctrine in his diocese, ordains and appoints the clergy, consecrates churches, and is the court of appeal for the lower orders of the clergy. The bishops of the Greek Church have similar functions, but on the whole less authority. They are always selected from the monastic orders.

In the Church of England bishops are nominated by the sovereign, who, upon request of the dean and chapter for leave to elect a bishop, sends a *congé d'élire*, or license to elect, with a letter missive, nominating the person whom he would have chosen. The election, by the chapter, must be made within twelve days, or the sovereign has a right to appoint whom he pleases. Bishops in the Protestant Episcopal Church in the United States are chosen by the general convention of clerical and lay deputies of the diocese over which they are to preside. In all, the bishops of England now number thirty-five, with thirty-seven suffragan and assistant bishops. In the disestablished church of Ireland there are eleven bishops, and seven in the Scottish Episcopal Church. There are also about eighty-one British colonial and eleven missionary bishops belonging to the Anglican Church. Of Roman Catholic bishops there are about 800. In the United States the Protestant Episcopal Church has over one hundred bishops, the R. Catholic Church eighty-eight. In the states there are also the bishops of the Methodist Episcopal Church, altogether sixty-one in number.

The United Brethren in Christ maintain the episcopal form of government, electing bishops whose duties correspond to those of the Methodist Episcopal church. Eight bishops are elected quadrennially by the General Conference.

The United Evangelical Church, in a General Conference of clerical and lay delegates elects two bishops with duties the same as the above.

In the Reformed Episcopal Church a bishop is a chief presbyter among his equals by virtue of his election only; the bishopric being an executive office and not an order. In the United States there are six Reformed Episcopal bishops.

Among the Lutherans and the Moravians the office of bishop has survived.

*Bishops in partibus infidelium* (in parts occupied by the infidels), in the Roman Catholic Church, are bishops consecrated under the fiction that they are bishops in succession to those who were the actual bishops in places where Christianity has become extinct. *Suffragan* bishops are bishops consecrated to assist other bishops in overtaking the duties of their dioceses. They differ from *coadjutor bishops*, likewise appointed to assist other bishops, in having no power to exercise jurisdiction.

**Bishop,** Isabella, traveler and writer, born in Yorkshire, England, in 1832. She traveled for many years in America and Asia and in 1892 was elected the first woman fellow of the Royal Geographical Society. She lectured widely and engaged in philanthropic work, building five hospitals and an orphanage in the

East. She wrote *Unbeaten Tracks in Japan, Korea and Her Neighbors, Among the Tibetans, The Yangtse Valley and Beyond*, etc. She died in 1904.

**Bishop,** Sir Henry Rowley, musical composer, born in London in 1786, and trained under Bianchi, composer to the London Opera House. In 1809, his first opera, the *Circassian's Bride*, was produced at Drury Lane. His name lives in connection with many glees, songs and smaller compositions, but probably most in his setting to music of *Home, Sweet Home*. From 1810 to 1824 he acted as musical composer and director to Covent Garden Theater. Shortly after the accession of Queen Victoria he was knighted. He was elected Reid professor of music in Edinburgh University in 1841, and in 1848 professor of music in the University of Oxford. He died in 1855.

**Bishop-Auckland,** a town of England, County Durham; with cotton factories and engineering works; and important coal mines in the neighborhood. The palace of the Bishop of Durham is here. Pop. 13,839.

**Bishop-Stortford,** a town of England, County Hertford, on the river Stort; trade chiefly in grain and malt. Pop. 8723.

**Bishop-weed** (*Ægopodium podagraria*), an umbelliferous plant of Europe, with thrice-ternate leaves and creeping roots or underground stems, a great pest in gardens from its vigorous growth and the difficulty of getting rid of it; called also *Goutwort, Herb Gerard*, etc. Also a name of plants of the genus *Ammi*, and in the United States to an umbelliferous plant, *Ptilimnium capillaceum*.

**Biskara,** or Biskra (bis'ka-rà or bis'krà), a town of Algeria, the chief military post of the Sahara, with an important caravanserai. The oasis of Biskra contains about 180,000 date palms, with groves of olives, etc. Pop. of oasis, 10,413.

**Biskuptiz,** village in Silesia, Prussia, with large iron works. Pop. (1910) 15,252.

**Bisley,** a village in Surrey, England, the present place of the annual meeting of the National Rifle Association, formerly held at Wimbledon. Pop. 5210.

**Bismarck** (biz'mark), a city, capital of North Dakota, on the Missouri River. The city has several federal institutions and the state capitol and penitentiary, a government Indian school, Fort Lincoln, etc. It is on the main line of the Northern Pacific railway. Pop. 6800.

**Bismarck,** Herbert Fürst von, a German statesman, son of Prince Otto von Bismarck, born 1849. From 1886 to 1890 he was secretary of state for foreign affairs, an office he resigned at the time his father quit the post of chancellor. Died 1904.

**Bismarck Archipelago,** the name given by the Germans to New Britain, New Ireland, and other islands adjoining their portions of New Guinea. The archipelago was taken by Australian forces in September, 1914, during the European war.

**Bismarck Mountains,** a range in German New Guinea, reaching a height of 15,000 ft.

**Bismarck-Schönhausen** (bis'märk-sheun'-hou-zĕn), Otto Eduard Leopold, Prince von; born of a noble family of the 'Mark' (Brandenburg), at Schönhausen, April 1, 1815; studied at Göttingen, Berlin, and Greifswald; entered the army and became lieutenant in the Landwehr. After a brief interval devoted to his estates and to the office of inspector of dikes, he became in 1846 a member of the provincial diet of Saxony, and in 1847 of

Prince Bismarck.

the Prussian diet. In 1851 he was appointed representative of Prussia in the diet of the German Federation at Frankfort, where with brief interruptions he remained till 1859, exhibiting the highest ability in his efforts to checkmate Austria and place Prussia at the head of the German states. From 1859–62 he was ambassador to St. Petersburg, and in the latter year, after an embassy to Paris of five months' duration, was appointed first minister of the Prussian crown. The Lower House persistently refusing to pass

the bill for the reorganization of the army, Bismarck at once dissolved it (Oct., 1862), closing it for four successive sessions until the work of reorganization was complete. When popular feeling had reached its most strained point the Schleswig-Holstein question acted as a diversion, and Bismarck—by the skillful manner in which he added the duchies to Prussian territory, checkmated Austria, and excluded her from the new German confederation, in which Prussia held the first place—became the most popular man in Germany. As chancellor and president of the Federal Council he secured the neutralization of Luxemburg in place of its cession by Holland to France; and though in 1868 he withdrew for a few months into private life, he resumed office before the close of the year. A struggle between Germany and France appearing to be sooner or later inevitable, Bismarck, having made full preparations, brought matters to a head on the question of the Hohenzollern candidature for the Spanish throne. Having carried the war to a successful issue, he became chancellor and prince of the new German empire. Subsequently, in 1872, he alienated the Roman Catholic party by promoting adverse legal measures and expelling the Jesuits. He then resigned his presidency for a year, though still continuing to advise the emperor. Towards the close of 1873 he returned to power, retaining his position until in March, 1890, he disagreed with Emperor William II, and tendered his resignation. On his retirement the title of Duke of Lauenburg was conferred on him. In 1878 he presided at the Berlin Congress. Died July 30, 1898.

**Bismuth** (bis'muth), a metal of a silvery white color, with a faint red tinge. Chemical symbol Bi; atomic weight 208.5. It is found native, and exists also in combination with other elements. When melted in the process of production, it solidifies with a crystalline texture; crystallizing when pure more readily than any other metal. It shows the singular anomaly, that when subjected to great pressure its density becomes less. It repels a magnet more than any other metal. It unites readily with other metals to form alloys, one known as fusible metal, consisting of bismuth, lead and tin, having the remarkable property of melting in boiling water, its melting point being 200.75° F., or 12° below the boiling point of water. The specific gravity of bismuth is 9.83; it melts at 507° F. Bismuth enters into several compounds used in the arts, one of the most important being the trioxide, $Bi_2O_3$. It is employed in porcelain manufacturing for the purpose of giving a peculiar colorless, irised luster. It is also used in the manufacture of glass and for making paste jewelry (strass). One form of bismuth, the subnitrate or basic nitrate, called pearl white, pearl powder, etc., is used in the preparation of cosmetics. In therapeutics the subnitrate and subcarbonate are employed in various forms of gastro-intestinal disturbance. The main source of supply of bismuth has been Schneeberg in Saxony, where it occurs in combination with ores of cobalt, arsenic, and silver. It is also found in the Erzgebirge, between Saxony and Bohemia, in France, in South America and in New South Wales.

**Bison** (bi'son or biz'on), the name applied to two species of ox. One of these, the European bison or aurochs (*Bos bison* or *Bison europœus*), is now nearly extinct, being found only in the forests of Lithuania and the Caucasus. The other, or American bison, improperly termed buffalo (*Bison americanus*), found only in the region lying north and south between the Great Slave Lake and the Yellowstone River, and in parts of Kansas and Texas. It has become extinct in the wild state, though formerly to be met with in immense herds. The two species closely resemble each other, the American bison, however, being, for the most part, smaller, and with shorter and weaker hindquarters. The bison is remarkable for the great hump or projection over its shoulders, at which point the adult male is almost six feet in height; and for the long, shaggy, rust-colored hair over the head, neck, and forepart of the body. The American bison used to be much hunted for sport as well as for its flesh and skin, and to overhunting its destruction is due. There remain only a few small herds in captivity. The flesh of the bison is rather coarser grained than that of the American ox, but it was considered by hunters and travelers as superior in tenderness and flavor. It is estimated that the annual rate of destruction of this noble and valuable animal, between 1870 and 1872, was 2,500,000 head.

**Bispham** (bis'pam), David Scull, an American singer (1857- ). He was born in Philadelphia, Pa., and educated at Haverford College. He studied in Florence and began his operatic career in 1891 at the Royal English Opera in London. He sang the principal baritone rôles in the German, Italian and English operas at the Royal Opera, Covent Garden, London, and the Metropolitan Opera House, New York City. He achieved celebrity as a concert singer and added dramatic readings to his programs, and was the first of the great singers to employ English translations in his recitals of German songs.

**Bisque** (bisk), a kind of unglazed white porcelain used for statuettes and ornaments.

**Bissagos** (bis-sä'gos), a group of about thirty islands near the W. coast of Africa, opposite the mouth of the Geba, between lat. 10° and 12° N. The largest, Orango, is about 25 miles in length, and most of them are inhabited by a rude negro race, with whom some trade is carried on. Most of the islands are under native chiefs nominally vassals of Portugal. At Bolama, or Bulama, once a British settlement. There is a Portuguese town, a thriving and pleasant place, the seat of government for the Portuguese possessions in this quarter.

**Bissell** (bis'sel), GEORGE EDWIN, an American sculptor, born in Connecticut in 1839. Served in the Civil war, and studied in Paris. Examples of his work are a soldiers' and sailors' monument, a statue of Abraham Lincoln in Edinburgh, Scotland, and a statue of President Arthur in Madison Square, New York.

**Bissen,** WILHELM, a Danish sculptor, born in 1798; died in 1868. He studied at Rome under Thorwaldsen, who in his will appointed Bissen to complete his unfinished works and take charge of his museum. Bissen's own works include a classic frieze of several hundred feet for the palace-hall at Copenhagen, an Atalanta hunting, Cupid sharpening his arrows, etc.

**Bissextile.** See *Leap-year.*

**Bistort** (*Polygŏnum bistorta*), a perennial plant of the buckwheat family (*Polygonaceæ*), found in Britain, and from its astringent properties (it contains much tannin) sometimes used medicinally. It is also called adder's-wort and snakeweed. An allied dwarf species of alpine and arctic regions is *P. viviparum*, alpine bistort.

**Bistritz,** a town of Austria-Hungary, in Transylvania; in mediæval times a place of large commerce. Pop. 12,081.

**Bitanhol** (be-tăn-hōl'), a tree, *Calophyllum inophyllum*, widely distributed in tropical regions, yielding an aromatic resin, and from its seeds a bitter oil. Also called St. Mary's wood.

**Bithoor,** BITHUR (bit-hör') or BITTOOR, a town of India, N. W. Provinces, 12 miles N. W. of Cawnpore, on the Ganges, long the abode of a line of Mahratta chiefs, the last of whom died without issue in 1851. His adopted son, Nana Sahib, who claimed the succession, was the instigator of the massacre at Cawnpore. Pop. (1901) 7173.

**Bithynia** (bi-thin'ia), an ancient territory in the N. W. of Asia Minor, on the Black Sea and Sea of Marmora, at one time an independent kingdom, later a Roman province. The cities of Chalcedon, Heraclea, Nicomedia, Nicæa, and Prusa were in Bithynia.

**Bitlis.** See *Betlis.*

**Bitonto** (bē-ton'tō), a town of Italy, province of Bari, the seat of a bishop, with a handsome cathedral. The environs produce excellent wine. Pop. 30,617.

**Bitsch** (bich), a town in the north of Alsace-Lorraine, in a pass of the Vosges, having a strong citadel on a hill. Pop. (1905) 4000.

**Bittacomorpha** (bit-a-kō-mor'fă), a remarkable American genus of dipterous insects, family *Tipulidæ*, with short wings, banded legs and swollen feet. The larvæ are subaquatic. The respiratory tube of the pupa projects from the opposite end of the body.

**Bittacus** (bit'a-kus), a genus of mecopterous insects, of wide distribution and predatory habits, resembling the crane-fly. They make use of the hind legs for seizing their prey. Their larvæ live near the surface of the ground and feed on dead animal matter.

**Bitter,** KARL THEODORE FRANCIS, an American sculptor, born in Vienna in 1867. His work is chiefly monumental, being exhibited in such works as *Elements Controlled and Uncontrolled*, for the Chicago Exposition, and the large relief *Triumph of Civilization*, in the Pennsylvania Railway passenger station at Philadelphia.

**Bitterfeld** (bit'ter-felt), town in Prussian Saxony, on the Mulde, with manufactures of cloth, pottery, etc. Pop. 11,839.

**Bitter-king,** the *Soulamĕa amāra*, a tree of the quassia order, peculiar to the Moluccas and Fiji Islands, the root and bark of which, bruised and macerated, are used in the East as an emetic and tonic.

**Bitter Lakes,** salt lakes on the line of the Suez Canal.

**Bitterling,** a cyprinoid fish, *Rhodeus amarus*, resembling the bream, inhabiting the fresh waters of Central Europe.

**Bittern,** the name of several grallatorial birds, family *Ardeidæ* or herons, genus *Botaurus*. The common bittern is about 28 inches in length, about 44 in extent of wing; general color, dull yellowish brown, with spots and bars of black or dark brown; feathers on the

breast long and loose; tail short; bill about 4 inches long. It is remarkable for its curious booming or bellowing cry. The eggs (greenish brown) are four or five in number. The American bittern (*B. lentiginōsus*) has some resemblance to the common European bittern, but is smaller.

**Bittern,** the syrupy residue from evaporated sea-water after the common salt has been taken out of it. It is used in the preparation of Epsom salt (sulphate of magnesia). It was in this liquor that Balard is said to have discovered bromine in 1826.

**Bitter-nut,** a tree of North America, of the walnut order, the *Hicoria minima*, or swamp-hickory, which produces small and somewhat egg-shaped thin-shelled nuts; the kernel is bitter and uneatable.

**Bitter Root Range,** a mountain tract on the boundary line between Idaho and Montana. It belongs to the Rocky Mountain system, and has an altitude ranging between 9000 and 10,000 feet.

**Bitters,** the name given to aromatised beverages (generally alcoholic) containing some bitter vegetable substance. Gentian, bitter orange rind, angostura, rhubarb, cascarilla, quassia, cinchona, are all employed in the preparation of the various kinds of bitters. Carraway, cinnamon, juniper, cloves and other aromatics often are used in conjunction with the bitter principle with alcohol and sugar. Some bitters are prepared by maceration and filtration, others by distillation. Their alcoholic strength varies, but is generally about 40 per cent of alcohol.

**Bittersweet,** the woody nightshade, *Sōlānum dulcamāra* (see *Nightshade*).

**Bittervetch,** a name applied to two kinds of leguminous plants: (*a*) *Vicia ervilia*, a lentil cultivated for fodder; and (*b*) all the species of *Orŏbus, e.g.* the common bittervetch of Britain, and *O. tuberōsus*, a perennial herbaceous plant with racemes of purple flowers and sweet, edible tubers.

**Bitterwood,** the timber of *Xylopia glabra* and other species of *Xylopia*, order *Anonaceæ*, all noted for the extreme bitterness of the wood. The name is also given to other bitter trees, as the bitter-ash.

**Bitumen** (bi-tū'men), a substance of a resinous nature, composed principally of hydrogen and carbon and appearing in a variety of forms which pass into each other and are known by different names, from *naphtha*, the most fluid, to *petroleum*, a liquid mass, which is less so, thence to *maltha* or *mineral tar*, which is more or less cohesive, and finally to *asphaltum* and *elastic bitumen* (or *elaterite*), which are solid. It burns like pitch, with much smoke and flame. It consists of 84 to 88 of carbon and 12 to 16 of hydrogen, which is essentially the composition of naphtha and petroleum. The other forms contain also a certain amount of oxygen, which is particularly the case in asphalt, some specimens of which showing as much as 10 per cent. The degree of solidity in fact seems to be proportionate to the amount of oxygen present. It is a very widely spread mineral, and is now largely employed in various ways. As the binding substance in mastics and cements it is used for making roofs, arches, walls, cellar-floors, etc., water-tight, for street and other pavements, and in some of its forms for fuel and for illuminating purposes.

**Bituminous** (bi-tū'mi-nus) SHALE or SCHIST, an argillaceous shale impregnated with bitumen and very common in the coal-measures. It was largely worked for the production of paraffin, etc.

**Bituriges** (bi-ter'i-jēs), a Celtic people, who, according to Livy, were the most powerful in Gaul in the time of Tarquinius Priscus. They divided into two branches, the Bituriges Cubi and Bituriges Vivisci. The Bituriges Cubi (the Bituriges of Cæsar) inhabited the modern diocese of Bourges, including the departments of Cher and Indre, and partly that of Allier. Their chief towns were Avaricum (Bourges), Argentomagus (Argenton-sur Creuse), Neriomagus (Néris-les-Bains) and Noviodunum (probably Villate). They were conquered by Cæsar, and under Augustus they were incorporated in Aquintania.

**Bitzius** (bit'se-us), ALBERT, a popular Swiss author, better known by his pseudonym of Jeremias Gotthelf, born in 1797; died in 1854. His chief works were his *Sorrows and Joys of a Schoolmaster*, 1838–1839, *Grandmother Katy*, 1848; *Uli the Farm-servant*, 1841, and *Uli the Farmer*, 1850; *Stories and Pictures of Popular Life in Switzerland*, 1851.

**Bivalves** (bī'valvz), molluscous animals having a shell consisting of two halves or valves that open by an elastic hinge and are closed by muscles; as the oyster, mussel, etc.

**Bivouac** (biv'u-ak), the encampment of soldiers in the open air without tents, each remaining dressed and with his weapons at hand. It was the regular practice of the French revolutionary armies, but is only desirable

where great celerity of movement is required.

**Biwa Lake** (bē'wä), the largest lake in Japan, in the province of Omi. It is justly celebrated for the beauty of its scenery. It is 36 miles long, 12 in extreme width and of about 300 ft. maximum depth.

**Bixio,** NINO, an Italian soldier who greatly distinguished himself in Italy's struggle for liberty. He was born in 1821, and died in 1873.

**Bizerta** (be-zėr'tä), or BENZERT, a seaport of Tunis, the most northern town of Africa, with a channel communicating with the Lake of Bizerta, a fine, deep, salt-water lagoon teeming with fish, inland from and connected with which is a fresh-water lake. It is an important naval station of France. The country around is beautiful and fertile. Pop., chiefly Arab., about 12,000.

**Bizet** (bē-zā), ALEXANDER CÉSAR LÉOPOLD (called GEORGES), a French musical composer, was born in 1838 near Paris; died at Paris June 3, 1875. His first two operas *Les Pêcheurs de Perles* and *La Jolie Fille de Perth*, did not meet with much success. Better fortune attended his production of the incidental music to Alphonse Daudet's drama *L'Artésienne*, which arranged in the form of suites has a frequent place on modern programmes. It was reserved for his master piece, the opera *Carmen*, a dramatization by Meilhac and Halévy of Merimée's novel, to bring to Bizet the fame to which he was entitled; and it was in the enjoyment of the first fruits of this fame that he died at the age of 37.

**Bjelbog** (byel'bog), in slavonic mythology the pale or white god, as opposed to Tchernibog, the black god, or god of darkness.

**Björneborg** (byeur'ne-borg), a seaport of Finland on the Gulf of Bothnia. Pop. (1904) 16,053.

**Björnson,** BJORNSTJERNE (byeurn'-styern byeurn'son), a Norwegian novelist, poet, and dramatist, born in 1832. He entered the University of Christiania in 1852, and he speedily became known as a contributor of articles and stories to newspapers and as a dramatic critic. From 1857 to 1859 he was manager of the Bergen theater, producing during that time his novel *Arne* and his tragedy of *Halte Hulda*. The democratic tendencies to be found in his novels found a practical outcome in the active part taken by him in political questions bearing upon the Norwegian peasantry and popular representation. Among his tales and novels are: *Synnöve Solbakken: The Fishermaiden; A Happy Boy; Railways and Churchyards.* Among his dramatic pieces are: *The Newly-Married Couple; Mary Stuart in Scotland; A Bankruptcy*, etc. He also wrote poems and songs. He died in 1910.

**Black,** HUGH. An eminent theologian, born at Rothesay, in Buteshire, Scotland, on March 26, 1868. Was educated in the Rothesay Academy and received the degree of A.M. from the University of Glasgow in 1887. Was ordained in the Free Church of Scotland in 1891, and filled the ministry in St. George's United Free Church, Edinburgh, from 1896 to 1906, since which year he has held the office of practical theology in the Union Theological Seminary, New York City. He was delegate to the International Congress of Science and Art at the Louisiana Purchase Exposition, St. Louis, 1904. He is the author of *The Dream of Youth, Friendship, Culture and Restraint, Work, The Practice of Self-Culture*, etc.

**Black,** JEREMIAH S., born in Somerset Co., Pennsylvania, in 1810; died at York, Pa., in 1883. He became a lawyer; was elected a judge of the supreme court of the state in 1851, and 1854; was attorney-general under President Buchanan 1857-60, and secretary of state, 1860-61.

**Black,** JOSEPH, a distinguished chemist, born at Bordeaux, of Scotish parents, in 1728; died in 1799. He entered Glasgow University and studied chemistry under Dr. Cullen. In 1754 he was made Doctor of Medicine at Edinburgh, at Glasgow in 1756, and again at Edinburgh in 1766. In his *Experiments on Magnesia, Quicklime and other Alkaline Substances*, he made known his important discovery of 'fixed air' (carbonic acid gas), in which he preceded the discoveries of Priestley, Cavendish, and Lavoisier concerning the constituents of the atmosphere. His fame, however, chiefly rests on his theory of 'latent heat,' 1757 to 1763.

**Black,** WILLIAM, novelist, born at Glasgow in 1841, first studied art, but eventually became connected with the Glasgow press. In 1864 he went to London, and in the following year joined the staff of the *Morning Star*, for which he was special correspondent during the Franco-Austrian war of 1866. His early novel, *Love or Marriage*, 1867, was only moderately successful, but his *In Silk Attire, Kilmeny, A Princess of Thule*, and especially *A Daughter of Heth* (1871), gained him an increasingly wide circle of readers. After a period of editorial work on the *Daily News* he resumed the writing of fiction and added largely to his list of novels. He died Dec. 10, 1898.

**Black Art.** See *Magic.*

**Black-assize,** the popular name of a fatal pestilence which broke out at Oxford, England, at the close of the assizes of 1577, and was considered by the people as a judgment of heaven on a cruel sentence passed. From July 6 to August 12 more than 300 persons died in or near Oxford, including the judges, most of the jurymen and many members of the University.

**Black-band,** a valuable kind of clay iron-stone containing from 10 to 30 per cent of coaly matter, from which most of the Scotch iron was obtained.

**Black-beer,** a kind of beer of a black color and syrupy consistence made at Dantzic.

**Black-beetle,** a popular name for the cockroach. See also *Blapsidæ*.

**Blackberry,** a popular name of the *Rubus genus* or the berry itself. In the United States the fruit has been largely improved by cultivation and is used as a table berry and in pastry and also in making a blackberry wine and brandy.

**Blackbird** (*Turdus merŭla*), called also the *merle*, a well-known species of thrush, common throughout Europe. It is larger than the common thrush, its length being about 11 inches. The color of the male is a uniform deep black, the bill being an orange-yellow; the female is of a brown color, with blackish-brown bill. The song is rich, mellow, and flute-like, but of no great variety of compass. Its food is insects, worms, snails, fruits, etc. The blackbirds or crow blackbirds of America are quite different from the European blackbird, and are more nearly allied to the starlings and crows. See *Crow-blackbird*. The red-winged blackbird (*Agelaius phœnicĕus*), belonging to the starling family, is a familiar American bird.

**Black-boy,** a name for the grass-trees (*Xanthorrhœa*) of Australia yielding a gum or resin called black-boy resin or akaroid resin.

**Blackburn,** a manufacturing town and parliamentary borough of England, Lancashire, 21 miles N. N. W. from Manchester. It has a free grammar school, founded by Queen Elizabeth in 1557 and a free school for girls, founded in 1765. In its ownership of public utilities it is prominent among modern municipalities. Blackburn is one of the chief seats in the world of the cotton manufacture, there being a very large number of mills as well as works for making cotton machinery and steam engines. Coal formerly abounded in the vicinity. Pop. (1911) 133,064.

**Blackcap** (*Sylvia atricapilla*), an European passerine bird of the warbler family, 6 inches long, upper part of the head black, upper parts of the body dark gray with a greenish tinge, under parts more or less silvery white. The female has its hood of a dull rust color. The blackcap is met with in England from April to September. It ranks next to the nightingale for sweetness of song. The American blackcap is a species of titmouse (*Parus atricapillus*) so called from the coloring of the head. The American black-capped fly-catching warbler, *Myiodioctes pusillus*, and the black-headed gull, *Larus ridibundus*, are also given the name of black-cap.—The term is likewise popularly applied to the plant and fruit of the black-fruited raspberry, *Rubus occidentalis*, growing wild in many portions of the United States, and also extensively cultivated.—A name of the cattail reed, *Typha latifolia*.

**Black Chalk,** a soft variety of argillaceous slate, containing a variable per cent of carbon, and used for drawing.

**Black Cock,** the heathcock, the male of the black grouse. See *Grouse*.

**Black Death.** See *Plague*.

**Black Draught,** sulphate of magnesia and infusion of senna, with aromatics to make it palatable.

**Blackfeet Indians,** a tribe of American Indians, found in the United States and Canada, from the Yellowstone to Hudson Bay.

**Blackfish,** a name applied to a number of fishes. (*a*) A local English name of the female salmon about the time of spawning. (*b*) A name of the tautog, *Tautoga onitis*, a foodfish of the Atlantic coast. (*c*) A local Alaskan name of *Dallas pectoralis*, a fish which alone represents the suborder *Xenomi*. (*d*) A local name in New England of the common sea-bass, *Centropristes striatus*. (*e*) A name of a European scombroid fish, *Centrolophus pompilus*. (*f*) A local name in the Firth of Forth, Scotland, of the tadpole fish, *Raniceps trifurcatus*. (*g*) A name of three fishes of Australia: A sea-fish, *Incisidens simplex;* a fresh-water fish, *Gadopsis marmoratus;* a sea-fish, *Girella tricuspidata*. The name is also given to several delphinoid cetaceans, especially of the genus *Globicephalus*.

**Black Fly,** the name of certain flies, *Simulium molestum*, whose bite is very troublesome to man and beast in the Northern United States and Canada.

**Black Forest** (German, *Schwarzwald*), a chain of European mountains in Baden and Würtemberg, running almost parallel with the Rhine for about 85 miles. The Danube, Neckar, and other large streams rise in the Black Forest, which is rather a chain of elevated plains than of isolated peaks; highest summit, Feldberg, 4900 feet. The skeleton of the chain is granite, its higher points covered with sandstone. The principal mineral is iron, and there are numerous mineral springs. The forests are extensive, chiefly of pines and similar species, and yield much timber. The manufacture of wooden clocks, toys, etc., is the most important industry, employing many persons. The inhabitants of the forest are quaint and simple in their habits, and the whole district preserves its old legendary associations.

**Black Friars,** friars of the Dominican order; so called from their habit.

**Black Friday,** the name given to two days of financial disaster in American history. (1) Sept. 24, 1869, when a panic was caused in Wall St. by the daring effort of Fisk and Gould to corner the gold market, by buying up all the gold in the New York banks. This effort was frustrated by the government issuing gold. (2) Sept. 19, 1873, when a great financial crash took place in the New York Stock Exchange, followed by the panic of 1873. In England the name of Black Friday is given to two similar financial panics.

**Black Fungi,** an order of parasitic fungi of the class *Ascomycetes*, usually black in color. They include the *ergot* of rye, the *black-knot* of the plum-tree, etc.

**Black Guard** was a term used by the sixteenth century for the lowest menials of a noble house, the scullions who cleaned pots and pans. It was also applied to the hangers-on of an army, camp-followers, then a vagabond rabble. In its present form of blackguard it indicates a man of very disreputable character.

**Black-gum** (*Nyssa sylvatica*, order *Cornaceæ*, an American tree, yielding a close-grained, useful wood; fruit a drupe of blue-black color, whence it seems to get its name of 'black'; it has no gum. It is called also pepperidge, and has been introduced into Europe as an ornamental tree.

**Black Hand,** the name of and a symbol used by a society of Italian terrorists in the United States, which arose in the latter part of the 19th century. The methods of intimidation followed by its members were chiefly the use of blackmailing letters containing threats of personal violence or even death unless the demands of the blackmailers were complied with.

**Black Hawk,** a famous chief of the Sac and Fox Indians, born in 1767. He joined the British in 1812, and in 1831–32 opposed the removal of his tribe from Illinois and Wisconsin westward. A war followed, in which the Indians were soon subdued. He died in 1838.

**Blackheath,** a village and heath, England, Kent, about 6 miles S. E. of London Bridge. The common contains 267 acres within its present limits, and is much resorted to by pleasure parties. It has been the scene of many remarkable events, such as the insurrectionary gatherings of Wat Tyler and Jack Cade and the exploits of various highwaymen.

**Black Hills,** an elevated region in South Dakota and N. E. Wyoming, rich in timber and minerals, especially gold, of which large quantities have been mined. There are also large deposits of tin, but in a form not easily reducible. Harney's Peak, the second in height, is 7440 feet high. As a grazing country this region has no superior, and there is much fertile soil, while the climate is excellent. The approach to the Black Hills is through a region of inhospitable, treeless plains, with water too alkaline for use. This country was ceded to the government by the Dakota Indians in 1875, it having been previously largely invaded by miners.

**Black Hole of Calcutta,** a small chamber, 20 feet square, in the old fort of Calcutta, in which, after their capture by Surajah Dowlah, the whole garrison of 146 men were confined during the night of June 21, 1756. Only twenty-three survived. The spot is now marked by a monument.

**Blackie,** JOHN STUART, a Scottish writer, born at Glasgow in 1809; died in 1895. He passed as advocate at the Edinburgh bar in 1834, in which year appeared his metrical translation of *Faust*. In 1841 he was appointed to the chair of Latin literature in Marischal College, Aberdeen—a post held by him until his appointment to the Greek chair at Edinburgh in 1852, from which he retired in 1882. Both in writing and upon the platform his name was associated with various educational, social, and political movements. He published numerous works of interest to scholars and general readers.

**Blackletter,** the name commonly given to the Gothic characters which began to supersede the Roman characters in the writings of Western Europe towards the close of the twelfth century. The first types were in blackletter, but these were gradually modified in Italy until they took the later Roman shape introduced into most European states during the sixteenth century.

**Blacklist,** a list of bankrupts or other parties whose names are officially known as failing to meet pecuniary obligations, wilfully or otherwise.

**Black'lock,** THOMAS, a blind Scottish poet, born at Annan in 1721. He published a volume of poems in 1746 and subsequently entered the Scotch ministry. Died in 1791.

**Blackmail,** a certain rate of money, corn, cattle, or the like, anciently paid, in the north of England and in Scotland, to certain men who were allied to robbers, to be protected by then from pillage. It was carried to such an extent as to become the subject of legislation. Blackmail was levied in the districts bordering the Highlands of Scotland till the middle of the eighteenth century. In the United States, this term is applied to money extorted from persons under threat of exposure in print for an alleged offense; hush-money.

**Black Monday.** Easter Monday, April 14, 1360, when a great storm fell upon the army of Edward III, then lying before Paris, causing death to many men and horses.

**Black Mountain,** a mountain range and district on the Hazara border of the Northwest frontier province of India, inhabited by Yusafzai Pathans. Average height 8000 feet.

**Black Mountains,** the group in North Carolina which contains the highest summits of the Appalachian system. Mt. Mitchell being the highest peak, 6710 feet. See *Appalachian Mountains.*

**Blackmore,** RICHARD DODDRIDGE, novelist, born at Longworth, England, in 1825; educated at Tiverton School and Exeter College, Oxford, where he was graduated in 1847. In 1852 he was called to the bar at the Middle Temple, and afterwards practised as a conveyancer. Shortly afterwards he engaged in literary pursuits, publishing several volumes of verse, *Poems by Melanter, The Bugle of the Black Sea,* etc. These were followed by novels, *Clara Vaughan* (1864), *Cradock Nowell* (1866) and his masterpiece *Lorna Doone, a Romance of Exmoor* (1869). This work had a very large sale and is classed among the great novels of recent times. *The Maid of Sker* (1872) comes next to it in interest, and was followed by several other novels. He had a passion for gardening, and plant life is depicted in his books with force and truth. He published a translation of Virgil's *Georgics* (1862 and 1871). He died January 21, 1900.

**Black'more,** SIR RICHARD, physician and writer in verse and prose, the son of an attorney in the county of Wilts; entered the University of Oxford in 1668; took the degree of M.D. at Padua, and was admitted Fellow of the Royal College of Physicians in 1687. In 1695 he published his heroic poem *Prince Arthur,* and two years later was knighted and appointed physician to William III. A ponderously worthy man, mediocre as a poet, he became the common butt of the day, though no amount of ridicule was sufficient to restrain his desire for literary distinction. His *Paraphrases on Job* (1700) was followed by *Eliza, an Epic in Ten Books* (1705) and by the *Nature of Man* (1711). His poem the *Creation* (1712) received the praise of Addison and Johnson; but his *Redemption,* in six books (1722), and his *Alfred,* in twelve (1723), reverted to the unrelieved monotony of his earlier style. He left several prose works on theology and medicine, and died in 1729.

**Black'pool,** a much-frequented watering-place of England, on the coast of Lancashire, between the estuaries of the Ribble and Wyre. It consists of lofty houses ranging along the shore for about 3 miles, with an excellent promenade and carriage-drive; has libraries and newsrooms, two handsome promenade-piers, a large aquarium, fine winter-gardens, etc. Pop. 58,376.

**Black Prince,** the son of Edward III. See *Edward.*

**Black-quarter,** a kind of apoplectic disease which attacks cattle, indicated by lameness of the fore-foot, one of the limbs swelling, and after death being suffused with blood, which also is found throughout the body.

**Black River,** or Big Black River, a stream which rises in the east of Missouri, flows through that state and Arkansas, and after a course of nearly 400 miles enters White River in Arkansas, being its largest tributary. There are several other streams, of

smaller size, in the United States, known by the same name.

**Blackrock,** a town of Ireland, on Dublin Bay, with a population of 8719. Sea-bathing and residential locality.

**Black-rod,** in England, the usher belonging to the order of the Garter, so called from the black rod which he carries. His full title is Gentleman-usher of the Black Rod, and his deputy is styled the Yeoman-usher. They are the official messengers of the House of Lords; and either the gentleman- or the yeoman-usher summons the Commons to the House of Lords when the royal assent is given to bills; and also executes orders for the commitment of parties guilty of breach of privilege and contempt.

**Black Sea** (ancient *Pontus Euxinus*), a sea situated between Europe and Asia, and bounded by the Russian, Turkish and Balkan countries, being connected with the Mediterranean by the Bosporus, Sea of Marmora, and Dardanelles, and by the Strait of Kertsch with the Sea of Azov, which is, in fact, only a bay of the Black Sea. Area of the Black Sea and the Sea of Azov about 175,000 square miles, with a depth in the center of 1000 to 1070 fathoms and few shoals along its shores. The water is not so clear as that of the Mediterranean, and is less salt, since it receives many large rivers, the Danube, Dniester, Dnieper, Don, etc. Though not tidal, there are strong currents. The tempests on it are very violent, as the land which confines its agitated waters gives to them a kind of whirling motion, and in the winter it is scarcely navigable. During January and February the shores from Odessa to the Crimea are ice-bound. It contains few islands, and those of small extent. The most important ports are those of Odessa, Kherson, Eupatoria, Sebastopol, Batum, Trebizond, Samsun, Sinope, and Varna. The fisheries are of some value. After the capture of Constantinople the Turks excluded all but their own ships from the Black Sea until 1774, when, by the Treaty of Kainarji, they ceded to Russia the right also to trade in it. The same right was accorded to Austria in 1784, and by the Peace of Amiens to Britain and France in 1802. The preponderance thereafter gained by Russia was one of the causes of the Crimean war, in which she was compelled to cede her right to keep armed vessels in it, the sea being declared neutral by the Treaty of Paris, 1856. In 1871, however, when France could not attend, owing to the Franco-German war, the sea was deneutralized by a conference of the European powers at London in response to the Russian protest.

**Black-snake** (*Bascanion constrictor*), a common snake in North America, reaching a length of 5 or 6 feet, and so agile and swift as to have been named the *Racer*. It has no poison fangs, and is therefore comparatively harmless. It feeds on small quadrupeds, birds, and the like, and is especially useful in killing rats.

**Blackstone,** a town (township) of Worcester Co., Massachusetts, with a manufacturing village of the same name, 20 miles S. E. of Worcester. It has manufactures of cotton goods, etc. Pop. 5648.

**Blackstone,** SIR WILLIAM, an eminent jurist, born in London in 1723; educated at the Charter House and Pembroke College, Oxford. In 1743 he was elected fellow of All-Souls College, Oxford, and in 1746 was called to the bar; but, having attended the Westminster law-courts for seven years without success, he retired to Oxford. Here he gave lectures on law, which suggested to Mr. Viner the idea of founding a professorship at Oxford for the study of the common law; and Blackstone was in 1758 chosen the first Vinerian professor. In 1759 he published a new edition of the *Great Charter and Charter of the Forest;* and during the same year resumed his attendance at Westminster Hall with abundant success. In 1761 he was elected M.P. for Hindon, made king's counsel and solicitor-general to the queen. He was also appointed principal of New Inn Hall, which office, with the Vinerian professorship, he soon resigned. In 1765 he published the first volume of his famous *Commentaries on the Laws of England*, the other three volumes being produced at intervals during the next four years. Its merits as an exposition made it for a long period the principal textbook of English law. He died in 1780.

**Blacktail,** the common name in the West for two North American deer, the large male deer and especially the smaller Columbian blacktail, *Cariacus columbianus*. The latter bears some resemblance to the species found in the East, *Cariacus virginianus*, except that in place of the white tail present in the latter its tail is black.

**Black Vomit,** a name of yellow fever.

**Black Walnut** (*Inglans nigra*), one of the most valuable timber trees of the United States. It occurs generally in the eastern part of

the country, though overcutting has made it rare in many localities. Its solid, dark-red timber has long been esteemed as a cabinet wood, largely used for furniture. The tree is large and bears a nut which is edible.

**Black Warrior River,** a stream in Alabama, which empties into the Tombigbee; length about 300 miles. It is navigable for steamboats for 150 miles from its mouth, and is sometimes known by its Indian name of Tuscaloosa.

**Blackwater,** the name of fifteen different rivers and streams in the United Kingdom, the most important in Munster, Ireland.

**Blackwell,** Mrs. Antoinette Louisa Brown, an American suffragist, born 1825. She was ordained as minister to a Congregational church in 1853, subsequently becoming a Unitarian. A graduate of Oberlin, she was prominent in the suffragist movement. She wrote *The Sexes Throughout Nature, The Physical Basis of Immortality,* etc.

**Blackwell,** Elizabeth, the first woman to obtain the degree of M. D. in the United States. She was born in England in 1821, and settled in America with her parents in 1831, where from 1838 to 1847 she was engaged in teaching. After numerous difficulties she was admitted into the College of Geneva, N. Y., and graduated M. D. in 1849. She afterwards studied in Paris, and commenced practice in New York in 1851. In 1854 she opened a hospital for women and children in New York. After 1869 she practised in London and Hastings. Died September 8, 1910. She wrote a number of works.

**Blackwell's Island,** in the East river, New York, a part of New York city. It has an area of 120 acres. On it is a penitentiary, lunatic asylum, workhouse, almshouse, and several hospitals.

**Blackwood,** or Indian Rosewood, a leguminous tree of Hindustan (*Dalbergia latifolia*), the timber of which is much used in the manufacture of fine furniture. The Australian blackwood is the *Acacia melanoxylon.*

**Blackwood,** Sir Henry, a British admiral, born in 1770; died in 1832. He entered the navy early in life, showed great daring and courage, and as captain of the *Brilliant* in 1798 fought two French frigates, each of nearly double his own force off the island of Teneriffe, and beat them both off. He commanded a frigate at Trafalgar. He was made captain of the fleet in 1814, soon after created a baronet and promoted rear-admiral, and in 1819 was made commander-in-chief of the East India fleet. His last command was of the Chatham station.

**Blackwood,** William, an Edinburgh publisher, born at Edinburgh 1776; died in 1834. He started as a bookseller in 1804, and soon became also a publisher. The first number of *Blackwood's Magazine* appeared 1st of April, 1817, and it has always been conducted in the Tory interest. He secured as contributors most of the leading writers belonging to the Tory party, among them Sir Walter Scott, Lockhart, Hogg, Professor Wilson, De Quincey, Dr. Moir (Delta), Thomas, Aird, Dr. Maginn, etc.

**Bladder,** Urinary, a musculo-membranous bag or pouch present in all mammalia, destined to receive and retain for a time the urine, which is secreted by the kidneys. It occupies the anterior and median portion of the pelvis, and in the male of the human subject is situated behind the pubis and above and in front of the rectum; in the female above and in front of the vagina and uterus. The urine secreted by the kidneys is conveyed into this reservoir by means of two tubes called the ureters, which open near the neck or lower part of the bladder in an oblique direction, by which means they prevent the reflux of the urine. When empty it forms a rounded, slightly conoid mass about the size of a small hen's egg. As it gradually fills with urine its walls become distended in all directions except in front, and it then rises above the pelvis proper into the abdomen. It is held in its place by two lateral ligaments, one on each side, and an anterior ligament. The contents are carried off by the urethra, which, as well as the neck of the bladder, is surrounded near the bladder (in the male only) by a structure called the prostate gland.

**Bladder-fern.** See *Cystopteris.*

**Bladder-nut,** a name of shrubs or small trees of the genus *Staphylea,* order *Sapindaceæ,* natives of Europe, Asia, and North America, the fruits of which consist of an inflated bladdery capsule containing the seeds.

**Bladder-seed,** a weed of the umbelliferous family, noted for its inflated fruit.

**Bladder-senna,** a leguminous plant of South Europe, *Colutea arborescens;* suborder, *Leguminosæ.* It is given this name from its dry, inflated pod and from the fact that its leaflets are said to have been used to adulterate senna.

**Bladderwort** (blad'der-wort), the common name of various species of slender aquatic plants,

genus *Utricularia*, order *Lentibulariaceæ*, which are natives of Europe, the United States, etc., growing in ditches and pools. They are named from having little bladders or vesicles. These bladders have trap-door entrances which open only inwards. Small crustaceans, and other aquatic animals push their way into these bladders and are unable to escape; they are finally absorbed into the plant by star-shaped hairs lining the interior of the bladder.

**Bladder-wrack** (*Fucus vesiculōsus*), a sea-weed so named from the floating vesicles in its fronds. It has been used in medicine.

**Blaeu,** BLAEUW or BLAUW (blä'u), a Dutch family celebrated as publishers of maps and books. William (1571–1638) established the business at Amsterdam, constructed celestial and terrestrial globes, and published *Novus Atlas* (6 vols.), an excellent work, and (*Theatrum Urbium et Munimentorum*). His son John (died 1673) published the *Atlas Magnus* (11 vols.), and various topographical plates and views of towns. The works of this family are still highly valued.

**Blagovieshtchensk** (blä-go-vyes'-chensk), a Russian town of Eastern Siberia, for a time capital of the province of the Amoor, on the Amoor and Zeya rivers, near the Chinese town of Aigoon. It is the center of the Zeya gold-mining district. Pop. 37,368.

**Blaine** (blān), JAMES GILLESPIE, American statesman, born in Washington Co., Pennsylvania, in 1830. He entered Washington College, Pa., at the age of thirteen, graduated in 1847, studied law, acted as a teacher, and then having gone to Augusta, Maine, was for several years a newspaper editor. He was sent to Congress by Maine as a Republican in 1862, and was repeatedly re-elected. Soon becoming prominent, he was several times Speaker of the House of Representatives. In 1876 he entered the Senate, and the same year he was second in his candidature for presidential nomination by the Republican national convention; he was also unsuccessful in his candidature in 1880; but in 1884 he was nominated as Republican candidate for President by a large majority, though the presidency went to Mr. Cleveland. In 1884 appeared the first volume of his *Twenty Years in Congress*, a work which has had a very favorable reception. He was Secretary of State from 1889 to 1892. He died January 27, 1893.

**Blainville** (blaṇ-vēl), HENRI MARIE DUCROTAY DE, French naturalist, born 1777; died 1850. After attending a military school, and also studying art, his interest in Cuvier's lectures led him to the study of medicine and natural history. Cuvier chose him for his assistant in the College of France and the museum of natural history, and in 1812 secured for him the chair of anatomy and zoology in the Faculty of Sciences at Paris. In 1825 he was admitted to the Academy of Sciences; in 1829 he became professor in the Museum of Natural History, lecturing on the mollusca, zoophytes, and worms; and in 1832 he succeeded Cuvier in the chair of comparative anatomy there. His chief works are *L'Organisation des Animaux ou Principes d'Anatomie Comparée* (1822); *Manuel de Malacologie et de Conchyliologie* (1825); *Cours de Physiologie Générale* (1829–32); *Manuel d' Actinologie* (1834); *Ostéographie*, a work on the vertebrate skeleton.

**Blair** (blār), FRANCIS PRESTON, general and lawyer, born at Lexington, Kentucky, in 1821; died 1875. He was elected a member of Congress from Missouri in 1856, entered the Civil war and became major-general in 1862, commanding a corps in Sherman's army in 1864–65. In 1868 he was the Democratic candidate for Vice President, but was defeated; was U. S. Senator 1871–73. —MONTGOMERY BLAIR, his *brother*, born 1813, graduated at West Point 1835, and served in the Seminole war. Having left the army, he was appointed Postmaster General in President Lincoln's cabinet 1861–64. He subsequently left the Republican party and became a strong Democrat. Died 1883.

**Blair,** HUGH, a Scottish divine and author, born at Edinburgh in 1718; died in 1800. He was minister successively of Collessie in Fifeshire, Canongate Church, Edinburgh, Lady Yester's Church, and the High Church. In 1762 he was made professor of rhetoric and belles-lettres in the University of Edinburgh, being the first that ever occupied this chair. He was author of a *Dissertation on the Poems of Ossian; Lectures on Rhetoric and Belles Lettres*; and *Sermons*, which were long greatly esteemed, and which, attracting the attention of George III. procured for the author a pension of £200 a year.

**Blair,** ROBERT, author of *The Grave*, born at Edinburgh, in 1699; died in 1746. He was ordained in 1731 minister of Athelstaneford, where he spent the remainder of his life. His *Grave* was first printed in 1743, and is now esteemed as one of the standard classics of English poetical literature. His third son, Rob-

ert (1741–1811), rose to be president of the Court of Session.

**Blake,** EDWARD, Canadian lawyer and statesman, born in 1833. He was educated at Toronto, graduating from University College in 1857. He was called to the bar in 1856, and speedily gained a high place in his profession. In 1867 he became a member of the Ontario, as well as of the Canadian, Parliament, and in the former took the position of leader of the Liberal opposition. On his party coming into power in 1871 he became premier of the Ontario legislature, but after one session resigned. In 1873 he became a member of the Canadian cabinet, and soon after president of the council and minister of justice under the Mackenzie administration, which however had to go out of office as a result of the election of 1878. On his return to Parliament, in 1880, he was chosen leader of the Liberal party. He retired in 1891, and soon afterwards accepted an invitation to enter the British Parliament as an Irish Home Ruler.

**Blake,** ELI WHITNEY, inventor, born at New Haven, Connecticut, in 1795; died in 1886. He was the nephew of Eli Whitney, the inventor of the cotton gin, and assisted him in his gin factory in Connecticut, becoming its proprietor on his death. Of his inventions, the most useful is the Blake stone breaker, now extensively used.

**Blake,** LILLIE DEVEREUX, an American woman suffragist, born in Raleigh, S. C., 1833. One of her first attempts to gain equal rights for women was her demand for admittance to Yale University, which was denied her. In 1870 she espoused the cause of woman suffrage. Her lectures in reply to Rev. Dr. Morgan Dix were published in book form with the title *Woman's Place To-day*, and became a handbook on woman suffrage. She died Dec. 30, 1913.

**Blake,** ROBERT, a celebrated English admiral, was born at Bridgewater in 1599; died at the entrance of Plymouth Sound in 1657. Educated at Oxford, he was sent to Parliament for Bridgewater in 1640. This being soon dissolved he lost his election for the next, and sought to advance the parliamentary cause in a military capacity in the war which then broke out. He soon distinguished himself, and in 1649, was sent to command the fleet with Colonels Deane and Popham. He attempted to block up Prince Rupert in Kinsale, but the prince, contriving to get his fleet out, escaped to Lisbon, where Blake followed him. Being refused permission to attack him in the Tagus by the King of Portugal, he took several rich prizes from the Portuguese, and followed Rupert to Malaga, where, without asking permission of Spain, he attacked him and nearly destroyed the whole of his fleet. His greatest achievements were, however, in the Dutch war which broke out in 1652. On the 19th of May he was attacked in the Downs by Van Tromp with a fleet of forty-five sail, the force of Blake amounting only to twenty-three, but Van Tromp was obliged to retreat. On May 29 he was again attacked by Van Tromp, whose fleet was now increased to eighty sail. Blake had a very inferior force, and after every possible exertion was obliged to retreat into the Thames. In February following he put to sea with sixty sail, and soon after met the Dutch admiral, who had seventy sail and 300 merchantmen under convoy. During three days a running fight up the Channel was maintained with obstinate valor on both sides, the result of which was the loss of eleven

Admiral Blake.

men-of-war and thirty merchant ships by the Dutch, while that of the English was only one man-of-war. In this action Blake was severely wounded. On June 3 he again engaged Van Tromp and forced the Dutch to retire with considerable loss into their own harbors. In November 1654 he was sent with a strong fleet to enforce a due respect to the British flag in the Mediterranean. He sailed first to Algiers, which submitted, and then demolished the castles of Goletta and Porto Ferino, at Tunis, because the dey refused to deliver up the British captives. A squadron of his ships also blocked up Cadiz, and intercepted a Spanish Plate fleet. In April, 1657, he sailed with twenty-four ships to Santa Cruz, in Teneriffe; and notwithstanding the strength of the place, burned the ships of another Spanish Plate fleet which had

taken shelter there, and by a fortunate change of wind came out without loss. Embarking on another cruise, he died before returning to English soil, and was buried in Westminster Abbey, whence his body was removed at the Restoration and buried in St. Margaret's Churchyard.

**Blake,** WILLIAM, mystic artist and poet, author of many exquisite lyrics, and of designs mainly allegorical or symbolical, was the son of a London hosier, and was born in 1757. He was apprenticed to an engraver at the age of fourteen. After completing his apprenticeship he was for a short time a student in the Royal Academy, and for years supported himself mainly by engraving for the booksellers. In 1782 he married Catherine Boucher, who proved an invaluable help to him in his work. Next year he published *Poetical Sketches*, in the ordinary way and without illustrations. Failing to find a publisher for his next work, *Songs of Innocence*, he invented a process by which he was both printer and illustrator of his own poems. He engraved upon copper both the text of his poems and the surrounding decorative design, and to the pages printed from the plates an appropriate coloring was afterwards added by hand. In this way the whole of his future work was produced. Some of his other best-known works are: *Gates of Paradise*, *Book of Thel*, *Marriage of Heaven and Hell*, *Songs of Experience*, *Book of Urizen*, *Song of Los*, *Book of Ahania*, etc. He also illustrated Young's *Night Thoughts*, Blair's *Grave*, and *The Book of Job*. The distinguishing feature of his genius was the faculty of seeing the creations of his imagination with such vividness that they were as real to him as objects of sense. He died in 1827. His complete poetical works were collected in 1874, and a volume of etchings from his works, with descriptive text, was published in 1878.

**Blakelock,** RALPH ALBERT, an American painter, born in New York in 1847. His works, which include many landscapes and subjects from Indian life, are markedly original.

**Blanc** (blän), AUGUSTE ALEXANDRE PHILIPPE CHARLES, younger brother of Louis Blanc, born 1813; died 1882. An eminent art-critic, he was elected a member of the French Academy in 1878, and filled the chair of æsthetics and art-history in the Collège de France. He wrote *Grammaire des Arts du Dessin*, *L'Art dans la Parure*, *Observations sur les Arts Egyptien et Arabe*, etc.

**Blanc** (blän), JEAN JOSEPH LOUIS, French historian, publicist, and politician, born at Madrid 1811; died at Cannes 1882. He was educated at Rhodez and Paris, and early devoted himself to the career of journalism. In 1839 he founded the *Revue du Progrès*, in which first appeared his *De l'Organization du Travail*. In 1841–44 appeared his *Histoire de Dix Ans*: 1830–1840. On the outbreak of the revolution of 1848 Blanc was elected a member of the provisional government, and appointed president for the discussion of the labor question. After the closing of the Ateliers Nationaux, a scheme which he strenuously opposed, and the June insurrection of 1848, he was prosecuted for conspiracy, but escaped to England. During his residence there he wrote the bulk of his *Histoire de la Révolution Française*. His other works of note are: *Lettres sur l'Angleterre* (1865–67), *Histoire de la Révolution de* 1848 (1870), *Questions d'Aujourd'hui et de Demain* (1873–74). On the downfall of the Second Empire Blanc returned to Paris, and became a member of the National Assembly.

**Blanc,** MONT. See *Mont Blanc*.

**Blanchard** (bläṅ-shär), FRANÇOIS, a French aëronaut, born 1753; died 1809. In 1785 he crossed the Channel in a balloon, for which feat he received a pension from the French king. He made many remarkable ascents in various parts of the world. His wife, born 1778, was his companion in many of his voyages, and was killed by her balloon taking fire, 1819.

**Blanchard** (blan'shärd), LAMAN, an English miscellaneous writer, born in 1804; died in 1845. In 1828 he published a volume of poetry, entitled *Lyrical Offerings*. In 1831 he became editor of the *Monthly Magazine*, and was afterwards connected with several magazines and newspapers. The death of his wife affected him so deeply that in a moment of temporary insanity he committed suicide. His tales and essays, entitled *Sketches from Life*, were published with a memoir by Lord Lytton in 1846; his poetical works in 1876.

**Blanche of Castile,** daughter of Alphonso IX, queen of Louis VIII, King of France, and mother of St. Louis, born in 1187; died in 1252 or 1253. On the death of Louis VIII she procured the coronation of her son, and during his minority held the reins of government in his name with distinguished success. In 1244, when St. Louis left for the Holy Land, she again became regent, and gave new proofs of her abilities and firmness as a ruler.

**Blanching.** See *Etiolation.*

**Blanc-mange** (blĕ-mänzh'), a name used in cookery for different preparations of the consistency of a jelly, variously composed of dissolved isinglass, arrow-root, maize-flour, etc., with milk and flavoring substances.

**Bland,** RICHARD P., statesman, born near Hartford, Kentucky, in 1835. He was admitted to the bar of Utah in 1860; practised law in California and Nevada; went to Missouri in 1865 and was member of Congress from that state from 1872 until his death in 1899, with the exception of one term. He was author of the Bland silver bill, passed in 1878, and an advocate of tariff reform.

**Blane** (blān), SIR GILBERT, a Scottish physician, born in Ayrshire in 1749; died in 1834. He was educated at Edinburgh University, but took the degree of M. D. at Glasgow. He became private physician to Admiral Rodney, and then physician to the fleet in the W. Indies, in which position he introduced the use of lime-juice and other means of preventing scurvy into the navy. In 1783–95 he was physician in St. Thomas's Hospital. He was physician-in-ordinary to George IV both before and after he became king. His chief publication is *Elements of Medical Logic.*

**Blankenberghe** (blan'ken-berg), a much frequented seaside resort on the coast of Belgium, is 9 miles N. W. of Bruges. Pop. 5925.

**Blankenburg,** a town of Germany, duchy of Brunswick, on the northern slope of the Hartz Mountains, a favorite resort of tourists. On the summit of a height is the ducal palace. Pop. 10,173.

**Blankenese** (blan'ke-nā-ze), a Prussian town on the right bank of the Elbe, 5 miles W. of Altona; a pleasure-resort of the Altonese and Hamburgers. Pop. 4736.

**Blank Verse,** verse without rhyme, first introduced into English poetry (from the Italian) by the Earl of Surrey, who was beheaded in 1547. The most common form of English blank verse is the decasyllabic, such as that of Milton's *Paradise Lost,* or of the dramas of Shakespere. From Shakespere's time it has been the kind of verse almost universally used by dramatic writers, who often employ an additional syllable, making the lines not strictly decasyllabic. The first use of the term blank verse is said to be in Hamlet, ii. 2: 'The lady shall say her mind freely, or the blank verse shall halt for it.' The term is not applied to the Anglo-Saxon and early English alliterative unrhymed verse.

**Blanqui** (blän-kē), JEROME ADOLPHE, a French economist, born at Nice in 1798; died at Paris in 1854. While studying at Paris he made acquaintance with Jean Baptiste Say, and was induced to devote himself to the study of economics. He succeeded Say in the Conservatoire des Arts et Métiers as professor of industrial economy. Blanqui, who favored a free-trade policy, published, among other works, *Précis Élémentaire d'Économie Politique* and *Histoire de l'Économie Politique en Europe.*—LOUIS AUGUSTE, his brother, born in 1805; died 1881; was early engaged as a socialistic revolutionist and conspirator, and spent much of his life in prison.

**Blantyre** (blan-tīr'), a populous mining parish in Lanarkshire, Scotland, containing several villages, at one of which, 8 miles S. E. of Glasgow, Dr. Livingstone was born. This parish has given its name to an African mission station founded in 1876 by the Established Church of Scotland, on the heights which rise between the Upper Shiré river and Lake Shirwa, Nyassaland, now the center of settlement and trade.

**Blapsidæ** (blap'si-dē), a family of nocturnal black beetles, whose wings are generally wanting and their elytra attached to each other. They frequent gloomy damp places, and when seized discharge, in self-defense, a liquid of a peculiar penetrating odor.

**Blarney** (blar'nē), a village of Ireland, 4 miles N. W. of the city of Cork, with Blarney Castle in its vicinity. A stone called the *Blarney Stone,* near the top of the castle, is fabled to confer on those who kiss it the peculiar kind of persuasive eloquence alleged to be characteristic of the natives of Ireland.

**Blashfield,** EDWIN HOWLAND, an American painter, born in 1848; famous as a mural decorator. Examples of his work may be seen in the Library of Congress and in the Minnesota and Iowa State capitols.

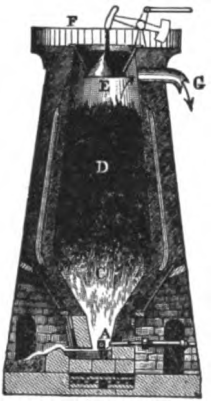
**Blasius** (bla'si-us), ST., Bishop of Sebaste, in Asia Minor, is said to have suffered martyrdom about 316. He is said to have been tortured with a wool-comb, hence he is claimed as the patron-saint of the wool-combers.

**Blasphemy** (blas'fe-mi), signifies the denying of the existence of God, assigning to him false attributes, or denying his true attributes; contumelious reproaches of Jesus Christ; profane scoffing at the Holy Scriptures, or exposing them to ridicule and contempt. In Catholic countries it also included the

speaking contemptuously or disrespectfully of the Holy Virgin or the saints. By the common law of England blasphemies of God, as denying his being and providence, all contumelious reproaches of Jesus Christ, etc., are punishable by fine and imprisonment or corporal punishment. In a case decided in 1883 it was held that a person may attack the fundamentals of religion without being guilty of a blasphemous libel 'if the decencies of controversy are observed.' In the United States, besides the common law, there are many statutes defining blasphemy; but they all hold it to consist in words regarding the Deity only. It is a misdemeanor at common law.

**Blast,** HOT. See *Blast-furnace.*

**Blast-furnace,** the name given to the common smelting furnace used for obtaining iron from its ores with the aid of a powerful blast of air. This air-blast, which is propelled by a powerful blowing-engine and is now invariably heated to a high temperature (1000° to 1400° F.), is injected by pipes called tuyeres, situated as shown at A. in the annexed vertical section, in the lowest part of the furnace, near to the hearth B. The conical part C, next above the hearth, is termed the boshes, and the interior is continued upwards, sometimes, as in the annexed cut, in a tapered body or cone, D, sometimes as a perpendicular cylinder, which is surmounted by an opening for the introduction of the materials from an external gallery, E.



Section of Blast-furnace.

The exterior consists of massive masonry of stone or firebrick, the body part being lined with two shells of firebricks separated by a thin space to allow for expansion, this space being generally filled with sand, ground fire-clay, or the like, to hinder the radiation of heat to the outside. When the body rises in the form of a perpendicular cylinder it is called the barrel. The cone or barrel is sometimes clasped round on the outside by numerous strong iron hoops, or is cased with iron plates fastened to the masonry by iron bolts. The boshes, C, are lined with firebrick or firestone, and the hearth, B, is built with large blocks of refractory stone. The charging of the furnace goes on all day and night, one charge consisting of a barrow-load of coal and a barrow-load of ore and usually lime, the last mineral acting as a flux. These charges are constantly passing downwards and undergoing a change as they come nearer the hotter parts of the furnace. Towards the lower part the earthy matter of the ore unites with the limestone and forms a slag, which finally escapes at an opening below the tuyeres, and the molten metal drops down and fills the lower part at B, to be drawn off at stated periods. This is done usually twice in the twenty-four hours by means of a round hole called a tap. The furnace is constantly kept filled to within about 2 feet of the top. The ore put in at the top takes about thirty-six hours before it comes out as iron. Hematite yields on an average about 55 per cent. of metal, and blackband, about 40 to 50. In the newer forms of furnaces the top is closed, and the gases formerly burned at the top are conveyed by pipes, G, to be utilized as fuel in heating the blast and in raising steam for the blowing-engine. The principle adopted is to close the top by a bell-and-cone arrangement, E, which is opened and shut at pleasure by hydraulic or other machinery. The height of furnaces varies from 50 to 80, and even in some cases to upwards of 100 feet, and the greatest width is about one-third of this.

**Blasting,** the operation of breaking up masses of stone or rock *in situ* by means of gunpowder or other explosive. In ordinary operations holes are bored into the rock one or more inches in diameter by means of a steel-pointed drill, which is struck with hammers or allowed to fall from a height. After the hole is bored to the requisite depth it is cleaned out, the explosive is introduced, the hole is 'tamped' or filled up with broken stone, clay, or sand, and the charge exploded by means of a fuse or by electricity. In larger operations, mines or shafts of considerable diameter take the place of the holes above described. Shafts are sunk from the top of the rock to various depths, sometimes upwards of 60 feet. This shaft joins a heading, or gallery, driven in from the face, if possible along a natural joint; and from this point other galleries are driven some distance in various directions, with headings at intervals, returning towards the face of the rock and terminating in chambers for the charges. Enormous charges are frequently made use of, upwards of twenty tons of gunpowder having been

fired in a single blast. One of the greatest blasting operations ever attempted was the removal of the reefs in the East River, near New York, known as Hell-gate. An entrance-shaft was sunk on the Long Island shore, from which the reef projected. From this shaft nearly twenty tunnels were bored in all directions, extending from 200 to 240 feet, and connected by lateral galleries. Upwards of a quarter million lbs. of dynamite, rend-rock and powder were used, and many thousands of tons of rock were dislodged. Numerous important improvements have been made in blasting by the substitution of rock-boring machines for hand labor. Of such machines, in which the 'jumper' or drill is repeatedly driven against the rock by compressed air or steam, being also made to rotate slightly at each blow, there are many varieties.

**Blastoderm** (blas'tōdĕrm), in biology, the germinal skin or membrane forming the superficial layer of the impregnated ovum, and from which the rudiment of the new being is formed.

**Blastogenesis** (blas'tō-gen'e-sis), in biology, reproduction by gemmation or budding.

**Blastoidea** (blas'toi-de-a), an order of fossil Echinodermata. closely allied to the Crinoidea. The body was enclosed in a kind of box, formed by jointed calcareous plates, and was, in most cases, permanently fixed to the sea-bottom by a stalk or column.

**Blastomere** (blas'tō-mēr), in biology, the term applied to each segment into which the ovum divides after impregnation. The segments may remain united as a single cell-aggregate, or some or all of them may become separate organisms.

**Blattidæ** (blat'i-dē), a family of insects of the order Orthoptera. They are extremely voracious, some species apparently eating almost everything that comes in their way. The type of the family is the well-known cockroach (*Blatta orientālis*).

**Blavatsky** (bla-vat'ski), HELENA PETROVNA, theosophist, born at Yekaterinoslav, Russia, in 1831, became a citizen of the United States. She was one of the chief founders of the Theosophical Society and its leader until her death in 1891. She wrote *Isis Unveiled*, *The Secret Doctrine*, *Key to Theosophy*, etc.

**Blaye** (blā), a fortified port of France on the Gironde, covering, with other forts, the approach to Bordeaux. Pop. 3423.

**Blazonry** (blā'zon-ri), in heraldry, the art of describing coats-of-arms in proper technical terms and method.

**Bleaching** (blēch'ing), the act or art of freeing textile fibers and fabrics and various other substances (such as materials for paper, ivory, wax, oils) from their natural color, and rendering them perfectly white, or nearly so. The ancient method of bleaching, by exposing the fabrics, etc., to the action of the sun's rays, and frequently wetting them, has been nearly superseded, at least where the business is conducted on a large scale, more complicated processes in connection with powerful chemical preparations being now employed. Among these the chief are chlorine and sulphurous acid, the latter being employed more especially in the case of animal fibers (silk and wool), while cotton, flax, and other vegetable fibers are operated upon with chlorine, the bleaching in both cases being preceded by certain cleansing processes. The use of chlorine as a bleaching agent was first proposed by Berthollet in 1786, and shortly afterwards introduced into Great Britain, where it was first used simply dissolved in water, afterwards dissolved in alkali, and then in the form of bleaching-powder, commonly called chloride of lime, the manufacture of which was patented by Mr. Tennant of St. Rollox, Glasgow, in 1799. In modern calico bleaching the preliminary process is *singeing* by passing the fabric over red-hot plates or through a gas-flame to remove the downy pile and short threads from the surface of the cloth. The goods next pass to the *liming* process, when they are uniformly and thoroughly impregnated with a supersaturated solution of lime. The next process is the *bowking* or boiling for several hours, after which they are washed. They are then *soured* by being passed through a solution of hydrochloric acid for the purpose of dissolving any traces of free lime which may have been left in the washing, and to decompose the calcareous soap formed by the bowking process. After boiling in kiers with a solution of soda-ash and rosin and another washing, the cloth is ready for the processes of *chemicking* or liquoring with bleaching-powder, and *white-souring* with a very dilute sulphuric acid. Another thorough washing concludes the operations of bleaching proper, after which the cloth goes through various finishing processes. Modifications of the same processes are adopted in bleaching linen, wool, silk, etc.

**Bleaching-powder,** chloride of lime made by exposing slaked lime to the action of chlorine.

It is regarded as a double salt of the chloride of calcium and hypochlorite of calcium. It is much used as a disinfectant, besides its use in bleaching.

**Bleak** (blēk), a small river fish, 6 or 7 inches long, the *Leuciscus alburnus*, of the Carp family. It somewhat resembles the dace, and is found in many European rivers. Its back is greenish, otherwise it is of a silvery color, and its silvery scales are used in the manufacture of artificial pearls. It is good eating.

**Bleek** (blāk), FRIEDRICH, a German Biblical scholar and critic, born in 1793; died in 1859. He was appointed professor of theology at Bonn 1829. He was the author of expository books, Introductions to the Old and New Testaments (1860–62), etc.

**Bleek,** WILHELM HEINRICH IMMANUEL, son of the above, an able linguist, especially in the South African languages, born at Berlin in 1827; died at Cape Town in 1875. In 1855 he went to South Africa and devoted himself to the study of the language, manners, and customs of the natives. He was principal author of the *Handbook of African, Australian, and Polynesian Philology*, 1858–63, his other chief productions being *Vocabulary of the Mozambique Languages*, 1856; *Comparative Grammar of South African Languages*, 1869; *Hottentot Fables and Tales*, 1864; and *The Origin of Language*, 1868.

**Blende** (blend), an ore of zinc, called also *Mock-lead*, *False Galena*, and *Black-jack*. Its color is mostly yellow, brown, and black. There are several varieties, but in general this ore contains more than half its weight of zinc, about one-fourth sulphur, and usually a small portion of iron. It is a native sulphide of zinc.

**Blenheim** (blen'im; Ger. blen'hīm), a village in Bavaria on the Danube. Near it was fought, August 13, 1704, during the war of the Spanish succession, the famous battle of Blenheim (or *Höchstädt*, from another village in the vicinity), in which Marlborough and Prince Eugene, commanding the allied forces of England and Germany (52,000 men), gained a brilliant victory over the French and Bavarians (56,000). The victors lost some 12,000 in killed and wounded; the vanquished 40,000, including prisoners.—The palatial residence of the Dukes of Marlborough at Woodstock, Oxfordshire, was named from this victory.

**Blenheim Dog,** a variety of spaniel, bearing a close resemblance to the King Charles breed, but somewhat smaller, so named from having been originally bred by one of the Dukes of Marlborough.

**Blenker,** LOUIS, born at Worms, in Hesse-Darmstadt, in 1812; died in Virginia in 1863. He served in the Bavarian army in 1833–37. In 1849, on account of his revolutionary activity in his native city, he was forced to retire to Switzerland, emigrating in the same year to the United States. He settled in New York, and at the outbreak of the Civil war he organized the 8th regiment of New York Volunteers. For distinguished services he was promoted to the command of a division in the Army of the Potomac. He died from injuries on the field.

**Blenkinsop,** JOHN, British inventor, born 1783; died 1831. He was the inventor of the first commercially successful locomotive steam-engine. It was a cogwheeled engine, employed on Hunslet Moor, near Leeds, to draw a load of 30 tons. To this demonstration George Stephenson, who saw Blenkinsop's experiment, is perhaps indebted for ideas used in building the *Rocket*.

**Blennerhasset,** HARMAN, an American lawyer, born in County Kerry, Ireland, 1765. In 1796 he married his niece, Margaret Agnew. Being ostracized by his family for this act by their families, the couple emigrated to America, where Blennerhasset purchased an island in the Ohio River, near Parkersburg, W. Va. Here in 1805 he was visited by Aaron Burr, in whose conspiracy to seize Texas he became implicated, supplying funds for its support and offering the use of his island as a depot of supplies and a training ground. On the collapse of the conspiracy the mansion and island were plundered by the Virginia troops. Blennerhasset fled, but was arrested and remained a prisoner until after the release of Burr. The island residence was abandoned and Blennerhasset went to Mississippi, then to Montreal, and finally returned to Ireland. He died in the island of Guernsey, February 2, 1831. His wife, Margaret, published *The Deserted Isle*, *The Widow of the Rock and Other Poems*. She died in New York in 1842.

**Blenny** (blen'i), a genus of acanthopterygious fishes (*Blennius*) distinguished by a short rounded head and a long, compressed smooth body. Owing to the smallness of their gill openings they can exist for some time without water.

**Blesbok** (bles'bok; *Alcelaphus albifrons*), an antelope of South Africa with a white marked face; formerly found in great numbers in the Orange Free State and much hunted.

**Blessing,** or BENEDICTION, a prayer or solemn wish imploring happiness upon another; a certain holy

action which, combined with prayer, seeks for God's grace for persons, and, in a lower degree, a blessing upon things, with a view to their efficiency or safety. The lifting up of the hands is an inseparable adjunct of the act of blessing. In the Roman Catholic Church formerly the thumb and the two first fingers of the right hand were extended, the two remaining fingers turned down; now all the fingers are extended. In the Greek Church the thumb and the third finger of the same hand are conjoined, the other fingers being stretched out. Some see in this position a representation of the sacred monogram in Greek letters of our Lord's name.

**Blessington** (bles'ing-ton), MARGARITE, COUNTESS OF, was born near Clonmel, Ireland, in 1789; died at Paris in 1849. She was twice married, the second time to Charles John Gardiner, earl of Blessington. After his death in 1829, Lady Blessington took up her abode in Gore House, Kensington. Her residence became the fashionable resort for all the celebrities of the time; and that notwithstanding a doubtful connection which she formed with Count D'Orsay, with whom she lived till her death. She wrote *Conversations with Lord Byron;* numerous novels, including *The Belle of a Season, The Two Friends, Strathern,* and the *Victims of Society;* and acted as editor, for several years, of the *Book of Beauty,* and the *Keepsake.*

**Bletia** (blē'ti-ä), a widely distributed genus of plants of the family *Orchideceæ.* In the American tropics about 20 species exist, and one species is found in China and Japan.

**Blicher** (blē'her), STEEN STENSEN, Danish lyrical poet and novelist, born 1782; died 1848. His collected poems, which are national and spirited, were published 1835–36; and his novels, which give admirable pictures of country life in Jutland, in 1846–47. He also translated *Ossian.*

**Blidah** (blē'dä), a fortified town of Algeria, 30 miles inland from Algiers, well built, with modern houses and public edifices, the center of a flourishing district, and having a good trade. Pop. 16,866.

**Bligh** (blī), WILLIAM, the commander of the ship *Bounty* when the crew mutinied in the South Seas and carried her off. He was born in Cornwall in 1753; died at London in 1817. The *Bounty* had been fitted out for the purpose of procuring plants of the bread-fruit tree, and introducing these into the West Indies. Bligh left Tahiti in 1789, and was proceeding on his voyage for Jamaica when he was seized, and, with eighteen men supposed to be quite loyal to him, forced into a launch, sparingly provisioned, and cast adrift not far from the island of Tofoa (Tonga Islands), in lat. 19° S. and lon. 184° E. By admirable skill and perseverance, though not without enduring fearful hardships, they managed to reach the island of Timor in forty-one days, after running nearly 4000 miles. Bligh with twelve of his companions, arrived in England in 1790, while the mutineers settled on Pitcairn Island, where their descendants still exist. Bligh became governor of New South Wales in 1806, but his harsh and despotic conduct caused him to be deposed and sent back to England. He afterwards rose to the rank of admiral.

**Blight** (blīt), a generic name commonly applied to denote the effects of disease or any other circumstance which causes plants to wither or decay. It has been vaguely applied to almost every disease of plants, whether caused by the condition of the atmosphere or of the soil, the attacks of insects, parasitic fungi, etc. The term is frequently limited to disease in cereal crops. See *Smut, Bunt, Ergot.*

**Blim'bing,** the Indian name of the fruit of *Averrhoa Bilimbi,* a small tree, family Oxalidaceæ, called also *Cucumber-tree,* the fruit being acid and resembling a small cucumber. The carambola (which see) belongs to the same genus.

**Blind** (blīnd), a screen of some sort to prevent too strong a light from shining in at a window or to keep people from seeing in. *Venetian blinds* are made of slats of wood, so connected as to overlap each other when closed, and to show a series of open spaces for the admission of light and air when in the other position.

**Blind** (blint), KARL, German political agitator and writer on history, mythology, and Germanic literature, born at Mannheim 1826. He was educated at Heidelberg and Bonn, and from his student days till he settled in England in 1852 he was continually engaged in agitating or in heading risings in the cause of German freedom and union. He was frequently imprisoned. The democratic propaganda was supported by his pen; and he wrote *Fire-burial among our Germanic Forefathers; Teutonic Cremation; Ygdrasil, or The Teutonic Tree of Existence,* etc. Died 1907.

**Blind,** The absence or deficiency of the sense of sight. Blindness may vary in degree from the slightest impairment of vision to total loss of sight; it may also be temporary or permanent. It is caused by defect, disease, or injury to the eye, to the optic

nerve or tract, or to that part of the brain connected with it. Old age is sometimes accompanied with blindness, occasioned by the drying up of the humors of the eye, or by the opacity of the cornea, the crystalline lens, etc. There are several causes which produce blindness from birth. Sometimes the eyelids adhere to each other or to the eyeball itself, or a contagious escharotic inflammation occurs, or a membrane covers the eyes; sometimes the pupil of the eye is closed, or adheres to the cornea, or is not situated in the right place, so that the rays of light do not fall in the middle of the eye; besides other defects. (See *Color Blindness, Hemeralopia. Nyctalopia.*) The blind are often distinguished for a remarkable mental activity, and a wonderful development of the intellectual powers. Their touch and hearing, particularly, become very acute.

As early as 1260 an asylum for the blind (L'Hospice des Quinze-Vingts) was founded in Paris by St. Louis for the relief of the Crusaders who lost their sight in Egypt and Syria; but the first institution for the instruction of the blind was the idea of Valentin Hauy, brother of the celebrated mineralogist. In 1784 he opened an institution in which they were instructed not only in appropriate mechanical employments, as spinning, knitting, making ropes or fringes, and working in pasteboard, but also in music, in reading, writing, ciphering, geography, and the sciences. For instruction in reading he procured raised letters of metal; for writing he used particular writing-cases, in which a frame, with wires to separate the lines, could be fastened upon the paper; for ciphering there were movable figures of metal, and ciphering-boards in which the figures could be fixed; for teaching geography maps were prepared upon which mountains, rivers, cities, and the boundaries of countries were indicated to the sense of touch in various ways, etc. Similar institutions were soon afterwards founded in Amsterdam, Berlin, Brussels, Copenhagen, Dresden, Edinburgh, Liverpool, London, Vienna, and in many towns of the United States. There are now comparatively few large cities that do not possess a school or institution of some kind for the blind. The occupations in which the blind are found capable of engaging are such as the making of baskets and other kinds of wicker-work, brushmaking, rope and twine making, the making of mats and matting, knitting, netting, fancy work of various kinds, cutting firewood, the sewing of sacks and bags, the carving of articles in wood, etc. Piano-tuning is also successfully carried on by some, and the cleaning of clocks and watches has even been occasionally practised by them.

Various systems have been devised for the purpose of teaching the blind to read, some of which consist in the use of the ordinary Roman alphabet, with more or less modification, and some of which employ types quite arbitrary in form. In all systems the characters rise above the surface of the paper so as to be felt by the fingers. The type adopted by Hauy was the script or italic form of the Roman letter. This was introduced into England by Sir C. Lowther, who printed the Gospel of St. Matthew in 1832 with type obtained from Paris. Before this Gall of Edinburgh made use of an embossed alphabet based on the ordinary Roman small letters, in which all curves were replaced by angular lines, and in 1834 he published the Gospel of St. John in this character. Subsequently he introduced various improvements, and in particular the letters were produced with serrated surfaces, thus giving greater distinctness. Alston of Glasgow, Howe of Boston, and others also used the Roman form; but the former (who was the first to print the whole Bible, in 1840) adopted the Roman capitals, while the latter adopted the small letters, printing in this type the Bible and many other books. Of alphabets deviating entirely or nearly so from the Roman letter, one consists of a stenographic shorthand invented by Lucas of Bristol; another is a phonetic shorthand devised by Frere of London. In Dr. Moon's alphabet some of the characters are Roman, others are based on or suggested by the Roman characters. The Braille system is one in which the letters are formed by a combination of dots. Dr. Moon's system from its simplicity and the size of its characters has been largely used in books for the blind, but the Braille System is now chiefly used. There are also systems by which they can write. See *Braille.*

**Blind-fish,** the name of several species of fish, family Amblyopsidæ, inhabiting the waters of American caves. They are all small, the largest not exceeding five inches. In the typical species (*Amblyopsis spelæus*) of the Mammoth Cave of Kentucky, the eyes are reduced to a useless rudiment hidden under the skin, the body is translucent and colorless, and the head and body are covered with numerous rows of sensitive papillæ, which form very delicate organs of touch.

**Blind Harry.** See *Harry the Minstrel.*

**Bliss,** TASKER HOWARD, general, U. S. A., born at Lewisburg, Pa., in 1853, was educated at Lewisburg (now Bucknell) University, graduated from U. S. Military Academy in 1875. He served through the Porto Rican campaign of 1898 and was appointed special envoy to Cuba to negotiate the treaty of reciprocity between that country and the United States in 1902. He was commander of the Departments of Luzon and Mindanao, Philippine Islands, from 1905 to 1909. In the latter year he became a member of the Army General Staff and president of the Army War College. He was appointed Assistant Chief of Staff in 1915 and succeeded Major-General Scott as Chief of Staff in 1916. He became brigadier-general in 1902, and was promoted to be a full general in the fall of 1917. With General Pershing he served with the American Expeditionary forces in Europe from 1917.

**Blister** (blis'tẽr), a topical application which, when applied to the skin, raises the cuticle in the form of a vesicle, filled with serous fluid, and so produces a counter-irritation. The Spanish fly-blister operates with most certainty and expedition, and is commonly used for this purpose, as are also mustard, hartshorn, etc. Also called vesicatory.

**Blister-beetle,** BLISTER-FLY, the Spanish fly used in making cantharidal blisters, etc.

**Blister-steel,** iron bars which, when converted into steel, have their surface covered with blisters, probably from the expansion of minute bubbles of air. Steel is used in the blister state for welding to iron for certain pieces of mechanism, but is not employed for making edge-tools. It requires for this purpose to be converted into cast or shear steel. See *Steel.*

**Bliz'zard,** a storm of very cold wind with fine, powdery snow, occurring in some parts of the United States and often causing loss of life through suffocation and cold. Their ordinary locality is in the region between the Rocky Mountains and the Mississippi, where they frequently occur, though disastrous ones are rare. In that of January, 1888, the severest on record, 235 persons lost their lives, while the cold was so intense that the Colorado River of Texas was frozen a foot deep, an unprecedented event.

**Bloch** (blo*h*), MARCUS ELIEZER, a naturalist of Jewish descent, born at Anspach in 1723; died 1799. His principal work is the *Naturgesch ̇hte der Fische* (Natural History of Fishes), folio, 1785–99, with 432 colored plates.

**Block,** a mechanical contrivance consisting of one or more grooved pulleys mounted in a casing or shell, which is furnished with a hook, eye. or strap by which it may be attached to an object, the function of the apparatus being to transmit power or change the direction of motion by means of a rope or chain passing round the movable pulleys. Blocks are single, double, treble, or fourfold, according as the number of sheaves or pulleys is one, two, three, or four. A *running block* is attached to the object to be raised or moved; a *standing block* is fixed to some permanent support. Blocks also receive different denominations from their shape, purpose, and mode of application. They are sometimes made of iron as well as of wood. Blocks to which the name of *dead-eyes* has been given, are not pulleys, being unprovided with sheaves. See also *Pulley.*

**Blockade** (blok-ād'), is the rendering of intercourse with the seaports of an enemy unlawful on the part of neutrals, and it consists essentially in the presence of a sufficient naval force to make such intercourse difficult. It must be declared or made public, so that neutrals may have notice of it. If a blockade is instituted by a sufficient authority, and maintained by a sufficient force, a neutral is so far affected by it that an attempt to trade with the place invested subjects vessel and cargo to confiscation by the blockading power. The term is also used to describe the state of matters when hostile forces sit down around a place and keep possession of all the means of access to it, so as to entirely cut off its communication with the outside world, and so compel surrender from want of supplies

**Block-books,** *block-printing.* Before and for a short time after the invention of printing, books were printed from wooden blocks each the size of a page and having the matter to be reproduced, whether text or picture, cut in relief on the surface. In China, where the art of printing was first discovered, this system continues in use, though movable types have long been known there. With their cheap labor block-books can be cheaply produced.

**Blockhouse,** a fortified edifice of one or more stories, constructed chiefly of blocks of hewn timber. Blockhouses are supplied with loopholes for musketry (*a*, *a*) and sometimes with embrasures for cannon, and when of more than one story the upper ones are made to overhang those below, and are furnished with machicolations or loopholes in the overhung floor, so that

a perpendicular fire can be directed against the enemy in close attack. Block-

Blockhouse.

houses are often of great advantage, and in wooded localities readily constructed.

**Block Island,** an island in the Atlantic, about 10 miles out from the mainland of Rhode Island, to which it belongs, and 8 miles long. It is a popular summer resort, constituting the township of New Shoreham. Has two lighthouses.

**Block Printing.** See *Block-books* and *Printing.*

**Blocksberg,** another name of the Brocken (which see).

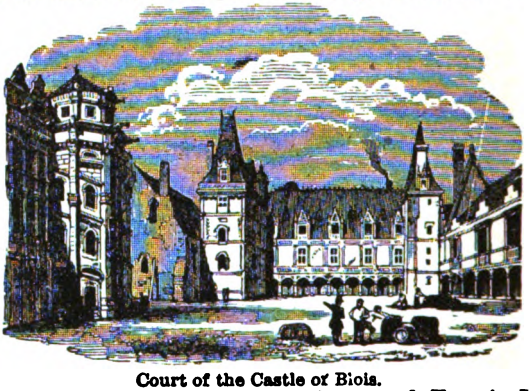
**Block-system,** a system of working the traffic on railways according to which the line is divided into sections of a few miles, each section generally stretching from one station to the next, with a signal and telegraphic connection, at the end of the section. The essential principle of the system is that no train is allowed to enter upon any one section till the section is signaled wholly clear, so that between two successive trains there is not merely an interval of time, but also an interval of space.

**Block-tin,** tin at a certain stage of refinement, but not quite pure.

**Bloemaert** (blö'märt), Abraham, a Dutch painter, born about 1565; died in 1651. He was the son of an architect and sculptor, who sent him to Paris, where he studied for three years, subsequently returning to Amsterdam and Utrecht, where he settled and painted all sorts of subjects, his landscapes being the most esteemed. He had four sons, of whom Cornelis (born 1603; died 1680) was sent by his father as an art student to Paris, and afterwards lived and worked in Rome as a distinguished engraver.

**Bloemfontein** (blöm'fon-tin), the chief town and seat of government of the Orange River Col., South Africa, 680 miles N. E. of Cape Town, situated in a high but healthy region. Pop. (1911) 26,929.

**Blois** (blwä), capital of the French dep. Loir-et-Cher, 99 miles s. s. w. Paris, on the Loire. It consists of an upper town, a lower town, and several suburbs, with one of which it communicates by a stone bridge of eleven arches. The old castle, which has played an important part in French history, was restored by the government since 1845. There is also a cathedral of late date, the Church of St. Nicholas (12th century), a bishop's palace, Roman aqueduct, etc. The castle was long occupied by the counts of the name; and became a favorite residence of the kings of France. In



Court of the Castle of Blois.

it Louis XII was born, and Francis I, Henry II, Charles IX, and Henry III held their courts.

**Blomfield** (blom'fēld), Charles James, Bishop of London, born at Bury-St.-Edmunds in 1786; died at Fulham Palace in 1857. At Cambridge he took high honors; and after filling successively several curacies, and acting for a time as chaplain to the Bishop of London, was presented to the rectory of St. Botolph, Bishopsgate. In 1824 he was made Bishop of Chester, and in 1828 Bishop of London. He was a distinguished classical scholar, and published editions of several of the dramas of Æschylus and of the lyric poets. His chief distinction was gained by his activity in the management of his diocese and his energy in the cause of church extension.

**Blond** (blon), Jacques Christophe le, miniature painter and originator of color printing, born at Frankfort-on-the-Main in 1670; died in a hospital at

Paris in 1741. He spent most of his life and all his means in comparatively unsuccessful experiments in printing engravings in color, and in attempts to reproduce the cartoons of Raphael in tapestry.

**Blondel** (blon-del). A French minstrel and poet of the twelfth century, and confidential servant and instructor in music of Richard Cœur de Lion. While his master was the prisoner of the Duke of Austria, Blondel, according to the legend, went through Palestine and all parts of Germany in search of him. He sang the king's own favorite lays before each keep and fortress till the song was at length taken up and answered from the windows of the castle of Loewenstein, where Richard was imprisoned. This story is preserved in the Chronicles of Rheims, of the thirteenth century, but probably has no foundation in fact. The poems of Blondel, with all the legendary and historical data relating to him, were published by Prosper Tarbé (Rheims, 1862).

**Blood** (blud), the fluid which circulates through the arteries and veins of the body of man and of other

Blood Corpuscles, Magnified.
*a*, man. *b*, goose. *c*, crocodile. *d*, frog. *e*, skate.

animals and is essential to the preservation of life and nutrition of the tissues. This fluid is more or less red in vertebrates, except in the lowest fishes. In insects and in others of the lower animals there is an analogous fluid which may be colorless, red, bluish, greenish, or milky. The venous blood of mammals is a dark red, but in passing through the lungs it becomes oxidized and acquires a bright scarlet color, so that the blood in the arteries is of a brighter hue than that in the veins. The central organ of the blood circulation is the heart (which see). The specific gravity of human blood varies from 1.045 to 1.075, and its normal temperature is 99° Fahr. The blood contains water, about 90 per cent, fibrin, albumin, blood corpuscles, both red and white, fatty substances and various animal matters and salts. When ordinary blood stands for a time it separates into two portions, a red coagulated mass consisting of the fibrin, corpuscles, etc., and a yellowish watery portion, the serum. The blood *corpuscles* or *globules* are characteristic of the fluid. These are minute, red and white bodies floating in the fluid of the blood. The red ones give color to the fluid, and are biconcave discs, oval in birds and reptiles, and round in man and most mammals. In man they average $\frac{1}{3200}$th inch in diameter, and in the Proteus, which has them larger than any other vertebrate, $\frac{1}{600}$th inch in length and $\frac{1}{127}$th in breadth. The white or colorless corpuscles, called *leucocytes*, are the same as the lymph corpuscles, and are spherical or lenticular, nucleated, and granulated, and rather larger than the red globules and number from 12,000 to 20,000 per cubic millimeter.

**Blood,** Avenger of, in Scripture, the nearest relation of any one that had died by manslaughter or murder, so called because it fell to him to punish the person who was guilty of the deed.

**Blood,** Thomas (commonly called Colonel Blood), born in Ireland about 1618; died at London in 1680; was a disbanded officer of Oliver Cromwell, and lost some estates in Ireland at the Restoration. His whole life was one of plotting and adventure, though it is probable that he acted a double part, keeping the government informed of so much as might secure his own safety. His most daring exploit was an attempt to steal the crown jewels (9th May, 1671) from the Tower. He was seized with the crown in his possession, but was not only pardoned by Charles, but obtained forfeited Irish estates of £500 annual value.

**Bloodbird** (*Myzomĕla sanguineolenta*), an Australian species of honeysucker so called from the rich scarlet color of the head, breast, and back of the male.

**Blood-cells,** or Blood-Corpuscles. See *Blood*.

**Bloodflower,** the popular name for some of the red-flowered species of *Hæmanthus*, a genus of bulbous plants of the Amaryllis family, natives of the Cape of Good Hope. The most common species is *Hæmanthus coccinĕus*, or Cape Tulip, a very showy plant, the bulb of which is used as a diuretic.

**Bloodhound,** a variety of dog with long, smooth and pendulous ears, remarkable for the acuteness of its smell, and employed to recover game or prey which has escaped wounded from the hunter, by tracing the lost animal by the blood it has spilt: whence the name of the dog. There are several varieties of this animal, as the English, the Cuban, and the African bloodhound. In former times bloodhounds were not only trained to the pursuit of game, but also to the chase of man. In America

they used to be employed in hunting fugitive slaves. The general idea, however, that they attack and wound the fugitive when overtaken is an error.

Bloodhound.

**Bloodletting.** See *Phlebotomy.*

**Blood-money,** the compensation by a homicide to the next of kin of the person slain, securing the offender and his relatives against subsequent retaliation; once common in Scandinavian and Teutonic countries, and still a custom among the Arabs. The term is also applied to money earned by laying or supporting a charge implying peril to the life of an accused person.

**Blood Poisoning,** a term commonly applied to septicæmia and allied diseases and in a wider sense to the effects on the human system of poison germs from any source.

**Blood-rain,** showers of grayish and reddish dust mingled with rain which occasionally fall, usually in the zone of the earth which extends on both sides of the Mediterranean westwardly over the Atlantic, and eastwardly to Central Asia. The dust is largely made up of microscopic organisms, especially the shells of diatoms, the red color being due to the presence of a red oxide of iron.

**Bloodroot** (*Sanguinaria Canadensis*), a plant of Canada and the United States, belonging to the poppy order, and so named from its root-stock yielding a sap of a deep-orange color. Its leaves are heart shaped and deeply lobed, the flower grows on a scape and is white or tinged with rose. The plant has acrid, narcotic properties, and has been found useful in various diseases. *Geum Canadense*, another American plant used as a mild tonic, is also known as bloodroot.

**Bloodstone.** See *Heliotrope.*

**Bloodvessels** are the tubes or vessels in which the blood circulates. See *Arteries*, *Veins*, and *Heart*.

**Bloodwood,** a name of several trees. Indian bloodwood (*Lagerstræmia flos-reginæ*) is a large tree of the henna family with wood of a blood-red color, used for many purposes. It is called also *jarool.*

**Bloodwort,** in the United States the *Hieracium venosum.*

**Bloody Assizes,** those held by Judge Jeffreys in 1685, after the suppression of Monmouth's rebellion. Upwards of 300 persons were executed after short trials, with little regard to evidence; very many were whipped, imprisoned, and fined; and nearly 1000 were sent as slaves to the American plantations.

**Bloom** (blöm), a lump of puddled iron, which leaves the furnace in a rough state, to be subsequently rolled into the bars or other material into which it may be desired to convert the metal. Also a lump of iron made directly from the ore by a furnace called a 'bloomery.'

**Bloomer Costume,** a style of dress adopted about the year 1849 by Mrs. Bloomer of New York, who proposed thereby to effect a complete revolution in female dress and add materially to the health and comfort of women. It consisted of a jacket with close sleeves, a skirt reaching a little below the knee, and a pair of Turkish pantaloons.

**Bloomfield** (blöm'fēld), a town of Essex Co., New Jersey, 12 miles N. W. of New York, and a residential city of New York and Newark business people. Has various manufactures. Pop. 15,070.

**Bloom'field,** ROBERT, an English poet, born at Honington, Suffolk, in 1766; died in 1823. In 1781 he was sent to learn the trade of a shoemaker with his brother in London. In the country, where he resided for a short time in 1786, he first conceived the idea of his poem the *Farmer's Boy*, which was written under the most unfavorable circumstances in a London garret. It was published in 1800, and had a great popularity. He subsequently published *Rural Tales, Wild Flowers, The Banks of the Wye, May Day with the Nurses*, etc. Several efforts were made to place him in good circumstances, but he died in poverty.

**Bloomington** (blöm'ing-ton), a city, county seat of Monroe Co., Indiana; 55 miles S. S. W. of Indianapolis; with extensive manufactures of wooden ware, gloves, baskets, electric batteries, etc.; and important limestone quarries in vicinity. Here is the Indiana State University. Pop. 10,300.

**Bloom'ington,** a thriving city of Illinois, 60 m. N. N. E. of Springfield, county seat of McLean County. It is one of the chief railroad centers of the State and has several important educational institutions, including the Illinois Wesleyan University, and the State Normal University. Has coal-mines, iron industries, railroad shops, canneries, candy factory, etc., and is a center for agricultural implements. Pop. 30,000.

**Bloomsburg** (blōms'burg), capital of Columbia Co., Pennsylvania, 39 miles S. W. of Wilkes-Barre. Here is a state normal school, and iron and textile industries, etc. Pop. 8200.

**Blouet** (blu-ā), PAUL, a writer, born in Brittany, France, in 1848; died in 1903. He was severely wounded in the Franco-German war, was subsequently a newspaper correspondent and a lecturer, and wrote works of humorous criticism on Great Britain and the United States under the name of 'Max O'Rell.' His books are *John Bull and His Island*, *A Frenchman in America*, etc.

**Blount** (blunt), CHARLES, son of Sir H. Blount, born in 1654; a deistical writer, said to have had the assistance of his father in writing a work called *Anima Mundi, or a Historical Account of the Opinions of the Ancients concerning the Human Soul after Death*, etc. He wrote various other works of the same nature, and also an excellent treatise on the liberty of the press. He shot himself 1693.

**Blount,** WILLIAM, American statesman, born in North Carolina in 1744. In 1782–83 and in 1786 and 1787 he was a delegate to the Continental Congress, president of the convention that formed the state of Tennessee in 1796, and the first United States senator from that state. Later impeached, he was expelled from the Senate, a proceeding that increased his popularity at home, where he became state senator.

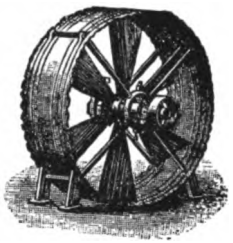
**Blouse** (blouz), a light loose upper garment, resembling a smock-frock, made of linen or cotton, and worn by men as a protection from dust or in place of a coat. A blue linen blouse is the common dress of French workmen.

**Blow** (blō), JOHN, a musical composer, born in 1648; died in 1708. He became organist of Westminster Abbey, and was afterwards appointed composer to the Royal Chapel. His secular compositions were published under the name of Amphion Anglicus.

**Blowfly,** a name for *Musca vomitoria*, *Sarcophāga carnaria*, and other species of two-winged flies that deposit their eggs on flesh, and thus taint it.

**Blowitz,** HENRY GEORGE DE, journalist, born at Pilsen, Bohemia, in 1825; died in 1903. He became a citizen of France in 1870, and after 1871 was the chief Paris correspondent of the London *Times*. He was noted for the accuracy and importance of his letters to the *Times*, was the most notable of interviewers, and was the channel through which Gambetta, Bismarck, the sultan, and others of leading position made public their views.

**Blowing-machine,** any contrivance for supplying a current of air, as for blowing glass, smelting iron, renewing the air in confined spaces, and the like. This may consist of a single pair of bellows, but more generally two pairs are combined to secure continuity of current. The most perfect blowing-machines are those in which the blast is produced by the motion of pistons in a cylinder, or by some application of the fan principle. For smelting and refining furnaces, where a blast with a pressure of 3 or 4 lbs. to the square inch is required, blowing-engines of large size and power, worked by steam, are employed.



Fan-blower.

**Blow'pipe,** an instrument by which a current of air or gas is driven through the flame of a lamp, candle, or gas jet, and that flame directed upon a mineral substance, to fuse or vitrify it, an intense heat being created by the rapid supply of oxygen and the concentration of the flame upon a small area. In its simplest form it is merely a conical tube of brass, or other substance, usually 7 inches long and ¾ inch in diameter at one end, and tapering so as to have a very small aperture at the other, within 2 inches or so of which it is bent nearly to a right angle, so that the stream of air may be directed sideways to the operator. The flame is turned to a horizontal direction, assumes a conical shape, and consists of two parts of different colors. The greatest heat is obtained at the tip of the inner blue flame. Here the substance subjected to it is burned or oxidized, a small piece of lead or copper, for instance, being converted into its oxide. Hence the name of the *oxidizing* flame. By shifting the substance to the interior blue flame, which is wanting in oxygen, this element will be abstracted from the substance, and

a metallic oxide, for instance, will give out its metal; hence this is called a *reducing* flame. Thus various minerals can be either oxidized or reduced at pleasure, and the pipe forms a ready test in the hands of the mineralogist, who may use fluxes along with substances tested, watch how they color the flame, what vapor they give out, etc. The blowpipe may be provided with several movable nozzles to produce flames of different sizes. The current of air is often formed by a pair of bellows instead of the human breath, the instrument being fixed in a proper frame for the purpose. A very powerful blowpipe is the oxyhydrogen or compound blowpipe, an instrument in which oxygen and hydrogen (in the proportions necessary to form water), propelled by hydrostatic or other pressure, and coming from separate reservoirs, are made to form a united current in a capillary orifice at the moment when they are kindled. Another form is the oxyacetylene blowpipe, by means of which a still higher temperature is obtained than by the oxyhydrogen flame. The blowpipe is used by goldsmiths and jewelers in soldering, by glassworkers in sealing the ends of tubes, etc., and extensively by chemists and mineralogists in testing the nature and composition of substances.

The name is also given to the pipe or tube through which poisoned arrows are blown by the breath, used by South American Indians and natives of Borneo. The tube or blowpipe is 8 to 12 feet long, with a bore scarcely large enough to admit the little finger; and the arrow is forced through by a sudden expulsion of air from the lungs (like a pea from a boy's pea-shooter), being sometimes propelled to a distance of 140 yards.

**Blubber** (blub'er), the fat of whales and other large sea animals, from which train-oil is obtained. The blubber lies under the skin and over the muscular flesh. It is eaten by the Eskimo and the sea-coast races of the Japanese islands, the Kuriles, etc. The whole quantity yielded by one whale ordinarily amounts to 40 or 50, but sometimes to 80 or more cwts.

**Blücher** (blü'her), GEBHARD LEBERECHT VON, a distinguished Prussian general, born at Rostock in 1742; died at Krieblowitz, Silesia, in 1819. He entered the Swedish service when 14 years of age and fought against the Prussians, but was taken prisoner in his first campaign, and was induced to enter the Prussian service. Discontented at the promotion of another officer over his head, he left the army, devoted himself to agriculture, and by industry and prudence acquired an estate. After the death of Frederick II he became a major in his former regiment, which he commanded with distinction on the Rhine in 1793 and 1794. After the battle of Kirrweiler in 1794 he was appointed major-general of the army of observation stationed on the Lower Rhine. In 1802, in the name of the King of Prussia, he took possession of Erfurt and Mühlhausen. Oct. 14, 1806, he fought at the battle of Auerstädt. After the Peace of Tilsit he labored in the department of war at Königsberg and Berlin. He than received the chief military command in Pomerania, but at the instigation of Napoleon was afterwards, with several other distinguished men, dismissed from the service. In the campaign of 1812, when the Prussians assisted the French, he took no part; but no sooner did Prussia rise against her oppressors than Blücher, then seventy

Blücher.

years old, engaged in the cause with all his former activity, and was appointed commander-in-chief of the Prussians and the Russian corps under General Winzingerode. His heroism in the battle of Lützen (May 2, 1813) was rewarded by the Emperor Alexander with the order of St. George. The battles of Bautzen and Hanau, those on the Katzbach and Leipsic, added to his glory. He was now raised to the rank of field-marshal, and led the Prussian army which invaded France early in 1814. After a period of obstinate conflict the day of Montmartre crowned this campaign, and, March 31, Blücher entered the capital of France. His king, in remembrance of the victory which he had gained at the Katzbach, created him Prince of Wahlstadt, and gave him an estate in Silesia. On the renewal of the war in 1815 the chief command was again committed to him, and he led his army into the Netherlands. June

15 Napoleon threw himself upon him, and Blücher, on the 16th, was defeated at Ligny. In this engagement his horse was killed, and he was thrown under its body. In the battle of the 18th Blücher arrived at the most decisive moment upon the ground, and taking Napoleon in the rear and flank assisted materially in completing the great victory of Waterloo. He was a rough and fearless soldier, noted for his energy and rapid movements, which had procured him the name of 'Marshal Vorwärts' (Forward).

**Blue,** one of the seven colors into which the rays of light divide themselves when refracted through a glass prism, seen in nature in the clear expanse of the heavens; also a dye or pigment of this hue. The substances used as blue pigments are of very different natures, and derived from various sources; they are all compound bodies, some being natural and others artificial. They are derived almost entirely from the vegetable and mineral kingdoms. The principal blues used in painting are *ultramarine*, which was originally prepared from lapis-lazuli or azure-stone—a mineral found in China and other oriental countries—but, as now prepared, it is an artificial compound of china-clay, carbonate of soda, sulphur, and rosin; *Prussian or Berlin blue*, which is a compound of cyanogen and iron; *blue bice*, prepared from carbonate of copper; *indigo blue*, from the indigo plant. Besides these, there are numerous other blues used in art, as *blue-verditer*, *smalt-* and *cobalt-blue*, from cobalt, *lacmus*, or *litmus*, etc. Before the discovery of aniline or coal-tar colors dyers chiefly depended for their blues on *woad*, *archil*, *indigo*, and *Prussian blue*, but now a series of brilliant blues are obtained from coal-tar, possessing great tinctorial power and various degrees of durability.

**Blue,** Victor, American naval officer, born in South Carolina, Dec. 6, 1865. Was graduated at the United States Naval Academy in 1887. During the war with Spain, he was landed at Acerranderos, Cuba, June 11, 1898, and successfully reconnoitred the position of Admiral Cervera's fleet, making an expedition of 72 miles, wholly within the enemy's lines.

**Bluebeard,** the hero of a well-known tale, originally French, founded, it is believed, on the enormities of a real personage, Gilles de Laval, Count de Retz, a great nobleman of Brittany, put to death for his crimes in 1440.

**Bluebell,** a name given to the wild hyacinth (*Scilla nutans*), and to the harebell (*Campanŭla rotundifolio*).

**Blueberry,** an American species of whortleberry or huckleberry (*Vaccinium Pennsylvanicum*), bearing a small black berry of pleasant flavor, and much used as a dessert fruit.

**Bluebird,** a small dentirostral, insessorial bird, the *Sylvia*, or *Sialia sialis*, very common in the United States. The upper part of the body is blue, and the throat and breast of a dirty red. It makes its nest in the hole of a tree or in the box that is so commonly provided for its use by the friendly farmer. The bluebird is the harbinger of spring to the Americans; its song is cheerful, continuing with little interruption from March to October, but is most frequently heard in the serene days of spring. It is also called *blue robin* or *blue redbreast*, and is regarded with the same sort of sentiments as the robin of Europe.

**Bluebooks,** the official reports, papers and documents printed for the British government and laid before the Houses of Parliament. They are so called simply from being stitched up in dark-blue paper wrappers; also, in America and England, a book containing the names of all persons holding public offices, with other particulars.

**Bluebottle,** *Centaurĕa Cyănus*, bachelor's button, a rather tall and slender plant, with blue flowers, growing in cornfields.

**Bluebottle Fly,** a large blue species of blowfly (*Musca vomitoria*).

**Bluebreast.** Same as *Bluethroat*.

**Blue-coat School.** See *Christ's Hospital*.

**Blue-eye** (*Entomyza cyanotis*), a common and beautiful bird of New South Wales, of the class of honeysuckers, and sometimes called the blue-cheeked honey-eater. Numbers are often seen clinging together and hanging in many positions frequently from the extreme ends of small branches.

**Bluefield,** a city, Mercer county, W. Va., 79 miles S. by E. of Charleston; has coal and coke industries. Pop. (1910) 11,188.

**Bluefields,** a town at the mouth of the Bluefields river, Nicaragua, Central America. Pop. 5000.

**Bluefish** (*Temnŏdon* or *Pomatŏmus saltātor*), a fish common on the eastern coasts of America, allied to the mackerel, but larger, growing to the length of three feet or more.

**Bluegowns,** an order of Scottish paupers, to whom the kings annually distributed certain alms. The

alms consisted of a blue gown or cloak, a purse containing as many shillings Scots (pennies sterling) as the years of the king's age, and a badge bearing the words '*pass and repass*,' which protected them from all laws against mendicity. Edie Ochiltree, in Sir W. Scott's novel of *The Antiquary*, is a type of the class. The practice of appointing bedesmen was discontinued in 1833, and the last of them drew his final allowance from the exchequer in Edinburgh in 1863.

**Bluegrass** (*Poa pratensis*), an American pasture grass of great excellence, especially abundant in Kentucky, which is called the Bluegrass State.

**Blue Island,** a post-village of Cook Co., Illinois, 12 miles s. of Chicago. It has stone quarries, smelting works, brickyards, etc. Pop. 8043.

**Blue Laws,** a name for certain severe laws said to have been made in the early government of New Haven, Connecticut, dealing with breaches of manners and morality, but most of which probably never existed.

**Blue Light.** See *Bengal Light.*

**Blue-mantle,** one of the English pursuivants-at-arms, connected with the Herald's College.

**Blue Mountains,** the central mountain range of Jamaica, the main ridges of which are from 6000 to 8000 feet high. Also a mountain chain of New South Wales, part of the great Dividing Range. The highest peaks rise over 4000 feet above the sea. The range is now traversed by a railway, which attains a maximum height of 3494 feet.

**Blue Nile.** See *Nile.*

**Blue Peter,** a blue flag having a white square in the center, used to signify that the ship on which it is hoisted is about to sail.

**Blue-pill,** a preparation of mercury for medicinal use. It consists of two parts by weight of mercury triturated with three parts of confection of roses till it loses its globular form. This is mixed with one part by weight of liquorice-root powder, so that 5 grains of the mixture contain 1 grain of mercury.

**Blueprint,** a ferricyanide positive print from a transparent negative original. B. P. paper is sensitized with ferricyanide, and acetic acid. and used for making blueprint photographs, and for copying transparent drawings and giving white lines on blue ground.

**Blue Ridge,** the most easterly ridge of the Alleghany or Appalachian Mountains, extending through Virginia and North Carolina, and under other names through Maryland, Pennsylvania and New York. The most elevated summits are the peaks of Otter (4000 feet) in Virginia. They are largely covered with forests of ash, hickory, oak, maple and other hardwood trees. The Blue Mountains of Pennsylvania and Virginia are the first westerly range of the Blue Ridge.

**Blue Sky Laws** are laws passed to prevent the operations of promoters of money-making schemes, so-called because the promises of these promoters are as "limitless as the blue sky." Such laws have been passed in 26 States, their purpose being to prevent the sale of fraudulent or deceptive issues of stock. Such sales have been sustained by decisions of some of the lower Federal courts, but a decision of the United States Supreme Court in 1917, dealing with the "blue sky" laws of Ohio, Michigan and South Dakota, has pronounced them legal, thus enabling the States to put an end to this nefarious method of defrauding ignorant purchasers of stock.

**Bluestocking,** a literary lady: applied usually with the imputation of pedantry. The term arose in connection with certain meetings held by ladies in the days of Dr. Johnson for conversation with distinguished literary men. One of these literati was a Mr. Benjamin Stillingfleet, who always wore blue stockings, and whose conversation at these meetings was so much prized that his absence at any time was felt to be a great loss, so that the remark became common, 'We can do nothing without the *blue stockings*'; hence these meetings were sportively called *blue-stocking clubs*, and the ladies who attended them *bluestockings*.

**Bluestone,** or BLUE VITRIOL, sulphate of copper, a dark-blue crystalline salt used in dyeing and for other purposes.

**Bluethroat,** a bird (*Cyanecula suecica*) with a tawny breast marked with a sky-blue crescent, inhabiting the northern parts of Europe and Asia. It is a bird of passage, and is taken in great numbers in France for the table.

**Blue Vitriol.** See *Bluestone.*

**Bluewing,** a genus of American ducks, so called from the color of the wing-coverts. One species (*Querquedula discors*) is brought in

great quantities to market, the flesh being highly esteemed for its flavor.

**Blumenbach** (blō'men-bâh), JOHANN FRIEDRICH, a celebrated German naturalist, born 1752; died 1840. He studied at Jena and Göttingen, and wrote on the occasion of his graduation as M.D. a remarkable thesis on the varieties of the human race. He became professor of medicine, librarian, and keeper of the museum at Göttingen in 1778, where he lectured for fifty years. His principal works are the *Institutiones Physiologicæ*, long a common text-book; *Handbuch der vergleichenden Anatomie* (Handbook of Comparative Anatomy), the best treatise that had appeared up to its date; and *Collectio Craniorum Diversarum Gentium*. The last work, published between 1790 and 1828, gives descriptions and figures of his extensive collection of skulls, still preserved at Göttingen. He advocated the doctrine of the unity of the human species, which he divided into five varieties, Caucasian, Mongolian, Negro, American, and Malay. His anthropological treatises, and the memoirs of his life by Marx and Flourens, were translated into English.

**Blunderbuss** (blun'dėr-bus), a short gun with a very wide bore, capable of holding a number of bullets, and intended to do execution at a limited range without exact aim.

**Blunt,** JOHN HENRY, an English theological writer, born in 1823; died in 1884. He held various curacies, and finally was appointed to the living of Beverston, Gloucestershire.

**Blunt,** JOHN JAMES, an English divine, born in 1794; died in 1855; after 1839 he was Lady Margaret professor of divinity at Cambridge.

**Boa** (bō'a), a genus of serpents, family Boidæ, having the jaws so constructed that these animals can dilate the mouth sufficiently to swallow bodies thicker than themselves. They are also distinguished by having a hook on each side of the vent; the tail prehensile; the body compressed and largest in the middle, and with small scales, at least on the posterior part of the head. The genus includes some of the largest species of serpents, reptiles endowed with immense muscular power. They seize deer and other animals, and crush them in their folds, after which they swallow them whole. The boas are peculiar to the hot parts of South America. The *Boa constrictor* is not one of the largest members of the genus, rarely exceeding 20 feet in length; but the name boa or boa constrictor is often given popularly to any of the large serpents of similar habits, so as to include the Pythons of the Old World and the Anaconda and other large serpents of America.

**Boabdil** (bō-âb-dēl'), ABU-ABDULLAH, last Moorish king of Granada, gained the throne in 1481 by expelling his father, Mulei Hassan; and became the vassal of Ferdinand of Aragon. By his tyranny he provoked the hostility of his own subjects, and Ferdinand, taking advantage of the dissensions which prevailed, laid siege to Granada. The Moors made a valiant defense, but Boabdil capitulated, and retired to a domain of the Alpujarras assigned him by the victor. He afterwards passed into Africa, and fell in battle while assisting the King of Fez in an attempt to dethrone the King of Morocco.

**Boadicea** (bō-ad-i-sē'a), Queen of the Iceni, in Britain, during the reign of Nero. Having been treated in the most ignominious manner by the Romans, she headed a general insurrection of the Britons, attacked the Roman settlements, reduced London to ashes, and put to the sword all strangers to the number of 70,000. Suetonius, the Roman general, defeated her in a decisive battle (A.D. 62), and Boadicea, rather than fall into the hands of her enemies, put an end to her own life by poison.

**Boar** (bōr), the male of swine not castrated. The wild hog, the original of the domestic pig, is generally spoken of as the *wild boar*. *See Hog.*

**Board** (bōrd), a number of persons having the management, direction, or superintendence of some public or private office or trust; also an office under the control of an executive government, the business of which is conducted by officers specially appointed for that purpose.

**Board of Education,** an important section of city administration, having the interests of the schools to look after and the best methods of providing for the education of the young to consider. By the aid of such official bodies the condition of the schools in this country has been greatly improved.

**Board of Trade,** an association among the business men of a city for the purpose of promoting its commercial interests; also often called 'chamber of commerce.' In 1868 a National Board of Trade was organized in this country, formed of delegates from the local boards and devoted to the discussion of topics of general commercial interest and the advancement of trade conditions. There are similar boards of trade in European countries

that of Great Britain being an important department of the government, as having the great interests of British commerce to look after.

**Boat** (bōt), a small open vessel or water craft usually moved by oars or rowing. Of recent years gasoline motors, like those used in automobiles, have come largely into use in the moving of boats. The forms, dimensions, and uses of boats are very various, and some of them carry a light sail, replacing the oar. The boats belonging to a ship of war are the launch or long-boat, which is the largest, the barge, the pinnace, the yawl, cutters, the jolly-boat, and the gig. The boats belonging to a merchant vessel are the launch or long-boat, before mentioned, the skiff, the jolly-boat or yawl, the stern-boat, the quarter-boat, and the captain's gig. For boats used in trials of speed see *Rowing, Regatta.*

**Boatbill,** *Cancrōma Cochlearia,* a South American bird of the family Ardeidæ or herons, about the size of a common fowl, with a bill not unlike a boat with a keel uppermost; its chief food is fish.

**Boatfly,** *Notonecta glauca,* an aquatic hemipterous insect which swims on its back; the hind legs aptly enough resembling oars, the body representing a boat; hence the name.

**Boat'swain** (commonly pronounced bō'sn), a warrant-officer in the navy who has charge of the sails, rigging, colors, anchors, cables, and cordage. His office is also to summon the crew to their duty, to relieve the watch, etc. In the merchant service one of the crew who has charge of the rigging and oversees the men.

**Bobbin** (bob'in), a reel or other similar contrivance for holding thread. It is often a cylindrical piece of wood with a head, on which thread is wound for making lace; or a spool with a head at one or both ends, intended to have thread or yarn wound on it, and used in spinning machinery (when it is slipped on a spindle and revolves therewith) and in sewing-machines (applied within the shuttle).

**Bobbinet** (bob'in-et), a machine-made cotton netting, originally imitated from the lace made by means of a pillow and bobbins.

**Bobbio** (bob'be-ō), a small town of N. Italy, prov. Pavia, the seat of a bishop, with an old cathedral, and formerly a celebrated abbey founded by St. Columbanus.

**Bob-o-link.** See *Rice-bunting.*

**Bobruisk** (bo-brō'isk), a fortified town of Russia, government and 88 miles S. E. of Minsk. Pop. 35,177.

**Boccaccio** (bok-kät'chō), Giovanni, Italian novelist and poet, son of a Florentine merchant, was born in 1313 at Certaldo, a small town in the valley of the Elsa, 20 miles from Florence; died there in 1375. He spent some years unprofitably in mercantile pursuits and the study of the canon law, but in the end devoted himself entirely to literature. He found a congenial atmosphere in Naples, where many men of letters frequented the court of King Robert, among the number being the great Petrarch. In 1341 Boccaccio fell in love with Maria, an illegitimate daughter of King Robert, who returned his passion with equal ardor, and was immortalized as Fiammetta in many of his best creations. His first work, a romantic love-tale in prose, *Filocopo,* was written at her command; as was also the *Teseide,* the first heroic epic in the Italian language, and the first example of the *ottava rima.* In 1341 he returned to Florence at his father's command, and during a three years' stay produced three important works, *Ameto, L'amorosa Visione,* and *L'amorosa Fiammetta,* all of them connected with his mistress in Naples. In 1344 he returned to Naples, where Giovanna, the granddaughter of Robert, who had succeeded to the throne, received him with distinction. Between 1344 and 1350 most of the stories of the *Decameron* were composed at her desire or at that of Fiammetta. This work, on which his fame rests, consists of 100 tales represented to have been related in equal portions in ten days by a party of ladies and gentlemen at a country house near Florence while the plague was raging in that city. The stories in this wonderful collection range from the highest pathos to the coarsest licentiousness. They are partly the invention of the author, and partly derived from the fabliaux of mediæval French poets and other sources. On the death of his father Boccaccio returned to Florence, where he was greatly honored, and was sent on several public embassies. Amongst others he was sent to Padua to communicate to Petrarch the tidings of his recall from exile and the restoration of his property. From this time an intimate friendship grew up between them which continued for life. They both contributed greatly to the revival of the study of classical literature, Boccaccio spending much time and money in collecting ancient manuscripts. In 1373 he was chosen by the Florentines to occupy the

chair which was established for the exposition of Dante's *Divina Commedia*. His lectures continued till his death. Among his other works may be mentioned *Filostrato*, a narrative poem; *Il Ninfale Fiesolano*, a love story; *Il Corbaccio, ossia Il Labirinto d'Amore*, a coarse satire on a Florentine widow; and several Latin works. The first edition of the *Decameron* appeared without date or place, but is believed to have been printed at Florence in 1469 or 1470. The first edition with a date is that of Valdarfer, Venice, 1471; what is, perhaps, the only existing perfect copy of this was sold in London in 1812 for $11,300.

**Boccage** (bok-äzh), MARIE ANNE DU, a French poetess much admired and extravagantly pralsed by Voltaire, Fontenelle, Clairaut and others; born in 1710; died in 1802. Her writings comprise an imitation of *Paradise Lost;* the *Death of Abel;* the *Amazons*, a tragedy; and a poem called the *Columbiad.*

**Bocca Tigris,** or BOGUE, the embouchure of the principal branch of the Chu Kiang, or Canton river, China.

**Boccherini** (bok-ker-ē'nē), LUIGI, an Italian composer of instrumental music, was born in 1740 at Lucca; died at Madrid in 1805. His compositions consist of symphonies, sextets, quintets, quartets, trios, duets, and sonatas for the violin, violoncello, and pianoforte. He never composed anything for the theater; and of church compositions we find but one, his *Stabat Mater.*

**Bochart** (bo-shär), SAMUEL, a French theologian and oriental scholar, born at Rouen in 1599; died in 1661 at Caen, where he was a Protestant clergyman. His chief works are his *Geographia Sacra* (1646), and his *Hierozoicon*, or treatise on the animals of the Bible (1663).

**Bochnia** (boh'ni-a), a town of Austria, in Galicia, gov. of Lemberg, 35 miles E. S. E. of Cracow. It has very productive mines of rock-salt, worked to a depth of 1000 feet. Also mines of zinc and gypsum. Pop. 10.071.

**Bocholt** (boh'olt), a town of Prussia, prov. of Westphalia, on the Aa; cotton-spinning and weaving, machinery, etc. Pop. 21,278.

**Bochum** (boh'um), a Prussian town, prov. of Westphalia, 5 miles E. N. E. of Essen. It is a great seat of steel and iron manufacture and has extensive coal mines. Pop. 136,931.

**Bock,** BOCKBIER (bok'bēr), a variety of German beer made with more malt and less hops than ordinary German beer, and therefore sweeter and stronger.

**Bockenheim** (bok'en-hīm), a town of Germany, forming a suburb of Frankfort-on-the-Main; flourishing manufactures of machinery, etc. Pop. 17,457.

**Böckh** (beúk), PHILIPP AUGUST, an eminent German classical antiquary, born at Carlsruhe in 1785; died at Berlin in 1867. He was educated at Carlsruhe and Halle, and obtained in 1811 the chair of ancient literature in the University of Berlin, where he remained for the rest of his life. He opened a new era in philology and archæology by setting forth the principle that their study ought to be an historical method intended to reproduce the whole social and political life of any given people during a given period. Among his chief works are an edition of *Pindar* (1811–22); *The Public Economy of the Athenians*, 1817, translated into English and French; *Investigations into the Weights, Coins, and Measures of Antiquity*, 1838; and *Documents concerning the Maritime Affairs of Attica*, 1840. The great *Corpus Inscriptionum Græcarum* was begun by him with the intention of giving in it every Greek inscription known in print or manuscript.

**Bocland,** BOCKLAND, or BOOK-LAND, one of the original English modes of tenure of manor-land which was held by a short and simple deed under certain rents and free services. This species of tenure has given rise to the modern freeholds.

**Bode** (bo'de), JOHN ELERT, a German astronomer, born in 1747; died in 1826. His best works are his *Astronomical Almanac* and his large *Celestial Atlas* ('Himmelsatlas'), giving a catalogue of 17,240 stars (12,000 more than in any former chart).—*Bode's Law* is the name given to an arithmetical formula, previously made known by Kepler and Titius of Wittenberg, expressing approximately the distances of the planets from the sun. It assumes the series 0, 3, 6, 12, 24, 48, 96, etc., each term after the second being double the preceding term; to each term 4 is added, producing the series 4, 7, 10, 14, 28, 56, 100, etc. These numbers are, with the exception of 28, roughly proportional to the distances between the planets and the sun. The law has no theoretical foundation.

**Boden-see.** See *Constance, Lake of.*

**Bodenstedt** (bō'den-stet), FRIEDRICH MARTIN, a German poet and miscellaneous writer, born in 1819. Having obtained an educational appointment at Tiflis he published a work on the peoples of the Caucasus (1848), and *A Thousand and One Days in the East,*

which were very successful. In 1854 he was appointed professor of Slavic at Munich, and in 1858 was transferred to the chair of old English. He was afterwards a theatrical director at Meiningen, etc. Among the best of his poetical works are the *Songs of Mirza-Schaffy*, purporting to be translations from the Persian, but really original, which have passed through over 100 editions. He translated Shakspere's *Sonnets*, and in conjunction with other writers issued a new translation of Shakspere's works. He died in 1892.

**Bodin** (bo-daṇ), JEAN, a French political writer, born about 1530; died in 1596. He studied law at Toulouse, delivered lectures on jurisprudence there, and afterwards went to Paris and practised. His great work *De la République* (1576) has been characterized as the ablest and most remarkable treatise on the philosophy of government and legislation produced from the time of Aristotle to that of Montesquieu.

**Bodle** (bod'l), a copper coin formerly current in Scotland, of the value of two pennies Scots, or the sixth part of an English penny. The name is said to have been derived from a mint-master of the name of Bothwell.

**Bodleian** (bod-lē'an) LIBRARY at Oxford, founded by Sir Thomas Bodley in 1598, opened in 1602. It claims a copy of all works published in Britain, and for rare works and MSS. it is said to be second only to the Vatican. It is estimated to contain about 500,000 books, besides 30,000 in manuscript. Sir Thomas Bodley, the founder (1544–1612), expended a large sum in acquiring rare and valuable books, and left an estate for the support of the library, and since his time a number of highly valuable collections have been given to it.

**Bodmer** (bod'mer), JOHANN JAKOB, a German poet and scholar, born near Zürich in 1698; died in 1783; was professor of history at Zürich for fifty years. Although he produced nothing remarkable of his own in poetry, he did great service by republishing the old German poets and by his numerous critical writings.

**Bodmer,** KARL, painter, was born in Zürich, Switzerland, in 1809. Many of his works were exhibited at the annual salons. He was a member of the Legion of Honor. He died October 31, 1893.

**Bodoni** (bo-dō'ni), GIAMBATTISTA, a celebrated Italian printer, born at Saluzzo in 1740; died in 1813. In 1758 he went to Rome, and was employed in the printing-office of the Propaganda. He was afterwards at the head of the ducal printing-house in Parma, where he produced works of great beauty. His editions of Greek, Latin, Italian, and French classics are highly prized.

**Boece** (bois), or BOYCE, HECTOR, a Scottish historian, was born at Dundee about 1465. He studied first at Dundee, and then at the University of Paris, where he became professor of philosophy in the College of Montaigu, and made the acquaintance of Erasmus. About 1500 he quitted Paris to assume the principalship of the newly-founded university of King's College, Aberdeen. In 1522 he published in Paris a history in Latin of the prelates of Mortlach and Aberdeen. Five years afterwards appeared the work on which his fame chiefly rests, the History of Scotland, in Latin—*Scotorum Historiæ a prima gentis origine*, etc. It abounds in fable, but the narrative seems to have been skillfully adjusted to the conditions of belief in his own time. In 1536 a translation of the history was published made by John Ballentyne or Bellenden for James V. He died in 1536.

**Boehm** (bām), JOSEPH EDGAR, sculptor, born at Vienna in 1834, of Hungarian parents; died in 1890. He studied art in Italy and Paris, and settled in England in 1862. He has executed many statues for public monuments, including those to Bunyan at Bedford, Carlyle and Tyndall on the Thames Embankment, Beaconsfield and Stanley for Westminster, etc., besides a great number of portrait-busts. In 1881 he was appointed sculptor-in-ordinary to the queen.

**Boehme** (beu'me), or BOEHM, JAKOB, a German mystical writer, born in 1575; died in 1624. He was apprenticed to a shoemaker in his fourteenth year, and ten years later he was settled at Görlitz as a master-tradesman, and married to the daughter of a thriving butcher of the town. He was much persecuted by the religious authorities, and at his death the rites of the church were but grudgingly administered to him. Raised by contemplation above his circumstances, a strong sense of the spiritual, particularly of the mysterious, was constantly present with him, and he saw in all the workings of nature upon his mind a revelation of God, and even imagined himself favored by divine inspirations. His first work appeared in 1616, and was called *Aurora*. It contains his revelations on God, man, and nature. Among his other works are *De Tribus Principiis*, *De Signatura Rerum*, *Mysterium Magnum*, etc. His writings

all aim at religious edification, but his philosophy is very obscure and often fantastic. The first collection of his works was made in Holland in 1675 by Henry Betke; a more complete one in 1682 by Gichtel (10 vols., Amsterdam). William Law published an English translation of them, 2 vols. 4to. A sect, taking their name from Boehme, was formed in England.

**Bœhmeria** (bē-mē'ri-a), a genus of plants, order Urticaceæ or Nettles, closely resembling the stinging nettle. A number of the species yield tenacious fibers, used for making ropes, twine, net, sewing-thread. *B. nivĕa* is the Chinese grass, the Malay *ramee*, which is shrubby and 3 or 4 feet high. It is a native of China, Southeastern Asia, and the Asiatic archipelago, where and in India it has long been cultivated. The plant has been introduced into cultivation in parts of the United States, Algeria, France, etc., under its Malay name of *ramee* or *ramie*. The British government has also become interested in its cultivation in such of the colonies or dependencies as are favorable to its growth. See *Ramie*.

**Bœotia** (bē-ō'she-a), a division of ancient Greece, lying between Attica and Phocis, and bounded E. and W. by the Eubœan Sea and the Corinthian Gulf, respectively, had an area of 1119 square miles. The whole country was surrounded by mountains, on the S. Mounts Cithæron and Parnes, on the W. Mount Helicon, on the N. Mount Parnassus and the Opuntian Mountains, which also closed it in on the E. The northern part is drained by the Cephissus, the waters of which form Lake Copais; the southern by the Asopus, which flows into the Eubœan Sea. The country originally had a superabundance of water, but artificial drainage works made it one of the most fertile districts of Greece. The inhabitants were of the Æolian race. Most of the towns formed a kind of republic, of which Thebes was the chief city. Epaminondas and Pelopidas raised Thebes for a time to the highest rank among Grecian states. Refinement and cultivation of mind never made such progress in Bœotia as in Attica, and the term Bœotian was used by the Athenians as a synonym for dullness, but somewhat unjustly, since Hesiod, Pindar, the poetess Corinna, and Plutarch were Bœotians. Along with Attica, Bœotia now forms a nomarchy of the kingdom of Greece.

**Boerhaave** (bör'hä-ve), HERMANN, a celebrated Dutch physician, was born in 1668; died in 1738. Destined for the clerical profession, in 1682 he was sent to Leyden to study theology. In 1689 he received the degree of Doctor of Philosophy; soon after he began the study of medicine, and in 1693 was made Doctor of Medicine at Harderwyck. In 1701 the University of Leyden chose him to deliver lectures on the theory of medicine; and in 1709 he was appointed to the chair of medicine and botany. He now published his *Institutiones Medicæ in Usus Annuæ Exercitationis*, and *Aphorismi de cognoscendis et curandis morbis in Usum Doctrinæ Medicinæ*, the former expounding his medical system, the latter classifying diseases and treating of their cause and cure. In 1714 he was made rector of the university.

**Boers** (börz; Dutch, *boer*, a peasant or husbandman), the Cape-Dutch name for the farmers of Dutch origin in South Africa. In 1836–37 large numbers of the Boers, being dissatisfied with the British government in Cape Colony, migrated northward to what is now Natal. Here their ill treatment of the natives soon led to war, and the British interfered and ultimately (1843) annexed the country. The Boers now moved into the highland country, where they established the South African, or Transvaal, and the Orange River republics. The ill treatment of the natives again led to war, in which the British once more aided the Boers and again made their aid the basis of a claim to the country. The Boers took up arms, defeated the British, and established their independence in 1881. At a later date the discovery of gold in the Transvaal region led to the influx of a large number of foreign miners, mainly British, their city of Johannesburg increasing in size till it had 150,000 inhabitants. When these demanded citizenship and the Boer assembly refused it, fearing they would be swamped by the foreign vote, trouble began again, leading in 1899 to war. The fighting continued until 1902, becoming a guerrilla war in the end, and finally leading to a British conquest of the country and its annexation to Great Britain, the Boers receiving very favorable terms. Their countries now form part of the Union of South Africa, formed in 1910, in which the Boers are a large and influential section of the population.

**Boethius,** a Latinized form of *Boece*. See *Boece*.

**Boethius** (bo-ē'thi-us), ANICIUS MANLIUS SEVERINUS, a celebrated Roman statesman and philosopher, was born about 470 A.D. in Rome or Milan, of a rich and noble family; executed in 525. Theodoric, king of the Ostrogoths,

then master of Italy, loaded him with marks of favor and esteem, and raised him to the first offices in the empire. He was three times consul, and received the greatest possible honor from people, senate, and king. But Theodoric, as he grew old, became irritable, jealous, and distrustful of those about him, and was influenced against his favorite by some whom Boethius had made enemies by his strict integrity and vigilant justice. He was finally accused of a treasonable correspondence with the court of Constantinople, imprisoned for a time, and then put to death. He made translations of the Greek philosophers, particularly Aristotle, which, in the middle ages, caused him to be regarded as the highest authority in philosophy. There is no evidence that he was a Christian. His fame now chiefly rests on his *Consolations of Philosophy*, written in prison, partly in prose and partly in verse, a work of elevated thought and diction. There is an Anglo-Saxon translation of it by King Alfred, of England, and it was early translated into other languages.

**Bog,** a piece of wet, soft, and spongy ground, where the soil is composed mainly of decaying and decayed vegetable matter. Such ground is valueless for agriculture until drained, but often yields an abundance of peat for fuel. A bog seems usually to be formed as follows:—A shallow pool induces the formation of aquatic plants, which gradually creep in from the borders to the deeper center. Mud accumulates round their roots and stalks, and a semifluid mass is formed, well suited for the growth of moss, particularly Sphagnum, which now begins to luxuriate, continually absorbing water, and shooting out new plants above as the old decay beneath; these are consequently rotted, and compressed into a solid substance, gradually replacing the water by a mass of vegetable matter. A layer of clay, frequently found over gravel, assists the formation of a bog by its power of retaining moisture. When the subsoil is very retentive, and the quantity of water becomes excessive, the superincumbent peat sometimes bursts forth and floats over adjacent lands. Bogs are generally divided into two classes; red bogs, or peat-mosses, and black bogs, or mountain mosses. The former class is found in extensive plains, frequently running through large districts, such as the Bog of Allen in Ireland, the depth varying from 12 to 42 ft. Their texture is light and full of filaments, and is formed by the slow decay of mosses and plants of different kinds. The lower part, being more entirely decayed, approaches nearer to the nature of humus than the upper portion, and, as being more carbonaceous, is more valuable for fuel. Black bog is formed by a more rapid decomposition of plants. It is heavier and more homogeneous in quality, but is usually found in limited and detached portions, and at high elevations, where its reclamation is more difficult. In Ireland bogs frequently rest on a calcareous subsoil, which is of great value in reclaiming them. In the reclamation of bog land a permanent system of drainage must be established; the loose and spongy soil must be mixed with a sufficient quantity of mineral matter to give firmness to its texture and fertilize its superabundant humus; proper manures must be provided to facilitate the extraction of nutriment from the new soil, and a rotation of crops adopted suitable for bringing it into permanent condition. The materials best adapted for reclaiming peat are calcareous earths, limestone gravel, shell-marl, and shell-sand. Thoroughly reclaimed bogs are not liable to revert to their former condition. Trunks of trees are often found in bogs (see *Bog-oak*), as are also bones of extinct animals.

**Bogardus** (bō-gar'dus), JAMES, an American inventor, born in 1800; died in 1874. Among his inventions were the 'ring-flyer' or 'ring-spinner' used in cotton manufacture (1828), the eccentric mill (1829), an engraving machine (1831) and the first dry gasmeter (1832). In 1839 he gained the reward offered for the best plan for carrying out the penny postage system by the use of stamps. In 1847 he built the first complete cast-iron structure in the world, and the first wrought-iron beams were made from his design. His delicate pyrometer and deep-sea sounding machine were valuable additions to scientific instruments.

**Bog Asphodel** (*Narthecium ossifragum*), a liliaceous plant with a raceme of small, golden-yellow, star-like flowers, common in early autumn on boggy mountain sides.

**Bogatzky** (bo-gätz'ke), KARL HEINRICH VON, German Protestant theological writer, born 1690; died 1774. His principal works are: *Schatz-Kästlein der Kinder Gottes*, 1718; *Geistliche Gedichte*, 1749. The English translation of the former is well known by the title of *Bogatzky's Golden Treasury*.

**Bog-butter,** a fatty, spermaceti-like mineral resin found in masses in peat-bogs, composed of carbon, oxygen, and hydrogen.

**Boggs,** FRANCIS M., artist, born at Springfield, Ohio, in 1855, and studied in Paris under Gerôme. His *Rough Day at Honfleur* won a prize in a New York competition, and his *La Place de la Bastille* was bought by the French government in 1882.

**Boghead Coal,** a brown cannel-coal of Scotland, found at Boghead, near Bathgate, and very valuable for gas and oil making.

**Bog Iron-ore,** a loose, porous, earthy ore of iron found in bogs and swamps, a hydrous peroxide, seldom occurring in such abundance as to render it of industrial importance.

**Boglipoor.** See *Bhagalpur.*

**Bog Myrtle** (*Myrica Gale*), also GALE, or SWEET GALE, an aromatic and resinous plant which covers large areas of bog and wet moorland, and was formerly put to many domestic uses, its twigs being used for beds and its roots and leaves as a substitute for hops. Wax was obtained from the berries. See *Candleberry.*

**Bog-oak,** trunks and large branches of oak found embedded in bogs and preserved by the antiseptic properties of peat, so that the grain of the wood is little affected by the many ages during which it has lain interred. It is of a shining black or ebony color, derived from its impregnation with iron, and is frequently converted into ornamental pieces of furniture and smaller ornaments, as brooches, ear-rings, etc.

**Bogodukhoff** (bog-o-duk-*hof'*), a town of Russia, in the government of Kharkov, with a considerable trade. Pop. 20,000.

**Bogomili** (bō-gō-mē'lē), an ascetic and mystical sect of the Greek Church founded in the 12th century. They held that God had two sons, Sathaniel and Logos, the former of whom rebelled and created the material world, but was finally subdued by the Logos or Christ. The sect was powerful in Bulgaria for about five centuries, and by its method of teaching did much to preserve and circulate old legends and folk-lore, including many early versions of Oriental fictions.

**Bog-ore.** See *Bog Iron-ore.*

**Bogos,** a Hamitic people of Northern Abyssinia, occupying a fine plateau and mountain district, and numbering about 10,000, almost entirely engaged in cattle-rearing, though there is some tillage and a trade in corn, butter, ivory, skins, buffalo-horns, and ostrich feathers. The men are well built and fairly handsome, the women of a lower type. They have peculiar patriarchal institutions with regularly established laws. The religion is the Christian, but Mohammedanism has a considerable number of adherents. Their chief village is Keren.

**Bogotá** (bō-gō-tä'; formerly *Santa Fé de Bogotá*), a city of South America, capital of Colombia and of the state or department of Cundinamarca, and seat of an archbishop, situated on an elevated plain 8863 feet above the sea, at the foot of two lofty mountains. Bogotá being subject to earthquakes, the houses are low, and strongly built of sun-dried brick. A number of handsomely laid out plazas have been preserved, ornamented with gardens and statuary. In Plaza Bolivar is a statue of Liberty by Pietro Tenerani, a pupil of Canova. Bogotá has always taken an interest in education, and because of this has been called the 'Athens of South America.' There is a public library of 50,000 volumes. There are a university, several colleges, observatory, botanic garden, theater, mint, etc. Bogotá is an emporium of internal trade, and has manufactures of soap, cloth, leather, etc., but not of much importance. It was founded in 1538. Pop. about 125,000.—The plateau of Bogotá is drained by the river Bogotá or Funza, which forms the fall of Tequendama, 475 feet high.

**Bogra,** a district and town of Bengal, India. Area of the division, 1359 sq. miles. Pop. of district (1901), 854,533; of town, 7094.

**Bog Spavin,** a name applied to a lesion of the hock-joint of the horse, due to distention of the capsule enclosing the joint. As the result of a severe sprain, it produces considerable lameness. The acute symptoms readily subside, but a permanent swelling may remain.

**Bog-trotter,** a term originally applied contemptuously to the Irish peasantry from the ability shown by them in crossing their native bogs by leaping from tussock to tussock—a frequent means of escape from police and soldiery.

**Bogue** (bōg), an acanthopterygian fish (*Box*), family Sparidæ, or gilt-heads, found in the Mediterranean, and sometimes on the coasts of Britain. The eyes are large and the general coloring brilliant.

**Bogue** (bōg), DAVID, the originator of the London Missionary Society, born in Berwickshire in 1750; died in 1825. He studied at Edinburgh, and was licensed as a preacher of the Church of Scotland. In 1771 he was employed as usher in London, and afterwards became minister of an independent chapel at Gosport, where he formed an institution

for the education of young men for the independent ministry. He then began the formation of the grand missionary scheme which afterwards resulted in the London Missionary Society, and took an active part in the foundation of the British and Foreign Bible Society and the Religious Tract Society. He wrote an essay on the *Divine Authority of the New Testament* (1802); *Discourses on the Millennium* (1813–16); and, in conjunction with Dr. Bennet, a *History of Dissenters* (1809–12).

**Bogus** (bō'gus), an Americanism meaning counterfeit, and applied to any spurious or counterfeit object; as, a *bogus* government, a *bogus* law. The origin of the term is uncertain.

**Bohea** (bo-hē), an inferior kind of black tea. The name is sometimes applied to black teas in general, comprehending Souchong, Pekoe, Congou, and common Bohea.

**Bohemia** (bō-hē'mi-a; Ger. *Böhmen*), a province with the title of kingdom belonging to the Austro-Hungarian monarchy (Austrian or Cisleithan portion), bounded by Bavaria, Saxony, the Prussian province of Silesia, Moravia, and the archduchy of Austria; area 20,060 sq. miles; population 6,318,280; more than 2,000,000 are Germans, the rest chiefly Czechs. The prevailing religion is the Roman Catholic, the country being an archbishopric with three bishoprics. The language of the country is the Czech dialect of the Slavonic (see *Czechs*). In some districts, and in most of the cities, German is spoken. Bohemia is surrounded on all sides by mountains, and has many large forests. Its plains are remarkably fertile. The chief rivers are the Elbe and its large tributary the Moldau. All sorts of grain are produced in abundance, as also large quantities of potatoes, pulse, sugar-beet, flax, hops (the best in Europe), and fruits. Wine is not abundant, but in some parts is of fairly good quality. The raising of sheep, horses, swine, and poultry is carried on to a considerable extent. The mines yield silver, copper, lead, tin, zinc, iron, cobalt, arsenic, uranium, antimony, alum, sulphur, plumbago, and coal. It is especially rich in coal, its mines being the most productive in Austro-Hungary. There are numerous mineral springs, but little salt. Spinning and weaving of linen, cotton, and woolen goods are extensively carried on; manufactures of lace, metal and wood work, machinery, chemical products, beet-root sugar, pottery, porcelain, etc., are also largely developed. Large quantities of beer (Pilsener) are exported. The glassworks of Bohemia, which are known all over Europe, employ numerous workers. The trade, partly transit, is extensive. Prague, the capital, being the center of it. The largest towns are Prague, Pilsen, Reichenberg, Budweis, Teplitz, Aussig, and Eger. The educational establishments include the Prague University and upwards of 4000 ordinary schools.

Bohemia possesses a literature of considerable bulk, including in its works written in Czech by Moravian and Hungarian writers. The earliest fragment is doubtfully referred to the 10th century, and it was not till after the 13th century that it attained to any development. The next century was a period of great activity, and to it belong versified legends, allegorical and didactic poems, historical and theological works, etc. The most flourishing period of the older literature falls within 1409–1620, John Huss (1369–1415) having initiated a new era, which, however, is more fertile in prose works than in poetry. The following period, up to the beginning of the 19th century, was one of decline, but in recent times there has been a great revival, and in almost all departments Bohemian writers have produced works of merit.

Bohemia was named after a tribe of Gallic origin, the Boii, who were expelled from this region by the Marcomans at the commencement of the Christian era. The latter were obliged to give place to other Teutonic tribes, and these to the Czechs, a Slavic race who had established themselves in Bohemia by the middle of the 5th century, and still form the bulk of the population. The country was at first divided into numerous principalities. Christianity was introduced about 900. In 1092 Bohemia was finally recognized as a kingdom under Fratilas II. In 1230 the monarchy, hitherto elective, became hereditary. The monarchs received investiture from the German emperor, held one of the great offices in the imperial court, and were recognized as among the seven electors of the empire. Frequently at strife with its neighbors, Bohemia was successively united and disunited with Hungary, Silesia, Moravia, etc., according to the course of wars and alliances. Ottokar II (1253–78) had extended his conquests almost from the Adriatic to the Baltic, when he lost them and his life in contest with Rudolph, the founder of the house of Hapsburg. After the close of the Przemysl dynasty (which had held sway for about six centuries) by the assassination of Ottokar's grandson, Wenceslas III, the house of Luxemburg succeeded in 1310, and governed Bohemia till 1437, the reign of Charles II (1346–

78) being especially prosperous. Towards the close of this second dynasty civil wars were excited by the spread of the Hussite movement, the central figure of the struggle being John Ziska, the leader of the Taborites. A temporary union between the moderate Hussites and the Catholics having proved a failure, the reformed party elected as king, in 1433, the Protestant noble, George Podibrad. On his death in 1471 they chose Wladislas, son of Casimir, king of Poland, who also obtained the crown of Hungary. His son Louis lost both crowns with his life in the battle of Mohacz against the Turks, and Ferdinand of Austria became in 1527 sovereign of both kingdoms. Bohemia then lost its separate existence, being declared a hereditary possession of the house of Austria; and its subsequent history pertains to that of the Austrian Empire. In 1848 an attempt was made to assert its ancient independence against the Austrian dominion; a conflict took place, Prague was bombarded, and the insurrection suppressed.

**Bohemian Brethren,** a Christian sect of Bohemia, formed from the remains of the stricter sort of Hussites, in the latter half of the 15th century. They took the Scriptures as the ground of their doctrines throughout and sought to frame the constitution of their churches on the apostolic model. They had a rigid system of mutual supervision extending even to the minute details of domestic life. Being persecuted, numbers retired into Poland and Prussia. Those who remained in Moravia and Bohemia, and who had their chief residence at Fulneck in Moravia, were hence called *Moravian Brethren* (which see).

**Bohemian Forest** (*Böhmerwald*), a forested mountain ridge extending from the Fichtelgebirge southwards towards the confluence of the Ilz and the Danube, and separating Bavaria from Bohemia. The highest peaks are the Arber (4320 ft.) and the Rachel.

**Bohemond** (bō'he-mond), Marc, son of the Norman adventurer Robert Guiscard, who rose to be Duke of Apulia and Calabria, was born about 1056. After distinguishing himself in Greece and Illyria against Alexius Comnenus, he returned to find that in his absence his younger brother Roger had seized upon the paternal inheritance (1085). War ensued, but Bohemond, contenting himself with the principality of Tarentum, ultimately threw his energy into the Crusades. He took a leading part in the campaign in Asia Minor, captured Antioch (1098), and assumed the principality; but was taken prisoner in 1101 and held captive for two years. In 1106 he married Constance, daughter of Philip I of France, and after an unsuccessful renewal of war with Alexius died at Canossa in 1111. Five of his descendants held in succession the principality of Antioch for over a century and a half.

**Bohlen** (bō'len), Peter von, German orientalist, born in 1796; died in 1840. Having devoted himself to the oriental languages, he obtained an appointment at Königsberg in 1825 as extraordinary, and in 1830 as ordinary professor of oriental literature. The most important of his writings is *Das alte Indien* ('Ancient India').

**Böhme.** See *Boehme.*

**Böhmisch-Leipa** (*beu*'mish-lī-pâ), a town of Northern Bohemia, on the Polzen River. Pop. (1910) 12,297.

**Bohn** (bōn), Henry George, an English bookseller, born at London, of a German family, in 1796; died in 1884. He was the publisher of the well-known 'Libraries,' or collection of standard works at moderate prices, to which he contributed some translations and works edited by himself; and he prepared an edition of Lowndes's *Bibliographer's Manual,* etc.

**Bohol.** See *Bojol.*

**Böhtlingk** (*beut*'lingk), Otto, German Sanskrit scholar, born at St. Petersburg in 1815; chief work, a Sanskrit-German dictionary in 7 vols. (St. Petersburg, 1853–75), prepared in conjunction with Prof. Roth of Tübingen.

**Boiardo** (bō-yar'dō), Matteo Maria, Count of Scandiano, an Italian poet, scholar, knight, and courtier; born near Ferrara in 1434. From 1488 to 1494, the period of his death, he was commander of the city and castle of Reggio, in the service of Ercole d'Este, Duke of Modena. His chief poem was his uncompleted *Orlando Innamorato* (1495), a romantic epic, the principal Italian poem before the *Orlando Furioso,* of Ariosto, though now chiefly known by the *rifacimento* of Berni. His other works include a comedy, *Il Timone; Sonnetti e Canzoni; Carmen Bucolicon; Cinque Capitoli in terza rima;* and translations from Lucian, Apuleius and Herodotus.

**Boidæ** (bō'i-dē), a family of large non-venomous serpents, with two mobile hooks or spurs, the rudiments of hind-legs, near the anus. The type genus is Boa (which see).

**Boieldieu** (bwäl-d*yeu*), François Adrien, a celebrated composer,

born at Rouen in 1775. He early displayed great musical talent, his first opera, *La Famille Suisse*, being well received in 1795 at Rouen. In 1795 he repaired to Paris, and rose rapidly in reputation, producing several operas, of which the best was *Le Calife de Baġdad* (1799). Domestic difficulties drove him in 1802 to Russia, where he became musical director to the emperor. On his return to Paris in 1811 he produced, among other works, his two masterpieces, *Jean de Paris* (1812) and *La Dame Blanche* (1825), which placed him in the first rank of composers of French comic opera. For some years he was professor of composition and the pianoforte at the Conservatoire. He died of pulmonary disease in 1834.

**Boii** (boi'ē), a Celtic people, whose original seat is supposed to have been between the Upper Saône and the higher parts of the Seine and Marne. They migrated to Cisalpine Gaul, crossed the Po, and established themselves between it and the Apennines, in the country previously occupied by the Umbrians. After a more or less constant strife with the inhabitants of Southern Italy they attacked the Romans in support of Hannibal in B.C. 218, and though defeated, maintained the war until their subjugation by Scipio Nasica, B.C. 191. The remnant of the tribe sought refuge among the Tauriscans in the territory since called after them Bohemia, from which there was a later migration, about B.C. 58, to Bavaria, to which also they gave their name.

**Boil,** to heat a substance up to the point at which it is converted into vapor. The conversion takes place chiefly at the point of contact with the source of heat, and the bubbles of vapor, rising to the surface and breaking there, produce the commotion called *ebullition*. At the ordinary atmospheric pressure ebullition commences at a temperature which is definite for each substance. The escape of the heated fluid in the form of vapor prevents any further rise of temperature in an open vessel when the *boiling-point* has been reached. The exact definition of the boiling-point of a liquid is 'that temperature at which the tension of its vapor exactly balances the pressure of the atmosphere.' The influence of this pressure appears from experiments. In an exhausted receiver the heat of the human hand is sufficient to make water boil; while, on the contrary, in Papin's digester, in which it is possible to subject the water in the boiler to a pressure of three or four atmospheres, the water may be heated far above the normal boiling-point without giving signs of ebullition. From this relation between the ebullition of a liquid and atmospheric pressure the heights of objects above sea-level may be calculated by comparing the actual boiling-point at any place with the normal boiling-point. (See *Heights, Measurement of*). The boiling-point of water as marked on Fahrenheit's thermometer is 212°; on the Centigrade, 100°; on the Réaumur, 80°. Ether boils at about 96°, mercury at 680°, sulphur at 838°.

**Boil,** a small, painful swelling of no definite shape, in the skin and subcutaneous tissues of the body. Its base is hard, while its apex (which is formed by the contained *pus* when it is mature) is soft and of a whitish color. In treating a boil suppuration should be stimulated by poultices and fomentation; afterwards an incision should be made, and the matter, consisting of dead cellular tissue and pus corpuscles, or core, squeezed out. A wet antiseptic dressing must be applied until pus no longer forms. The stomach should be relieved by purgatives and tonics administered. Anodynes are sometimes necessary when the constitutional irritation is very great. Boils are due to infection by pus-producing germs by means of a scratch, picking a pimple, etc.

**Boileau-Despréaux** (bwä-lō-dā-prā-ō), NICHOLAS (commonly called *Boileau*), a French poet, born in 1636 at Paris. He studied in the Collège d'Harcourt and in the Collège de Beauvais, and entered the legal profession; but soon left it to devote himself entirely to belles-lettres. In 1660 appeared his first satire, *Adieux d'un Poète à la Ville de Paris*, followed rapidly by eight others, and ultimately by three more, to complete the series. They attacked with much critical acumen, and in vigorous but finely-finished verse, the poets and writers of the older school. In 1664 he wrote his prose *Dialogue des Heros de Roman*, which sounded the knell of the artificial romances of the period. His *Epistles*, written in a more serious vein, appeared at various times from 1669 onwards; but his masterpieces were the *L'Art Poétique* and *Le Lutrin*, published in 1674—the former an imitation of the *Ars Poetica* of Horace with reference to French verse, the latter a mock heroic poem. In many respects his writings determined the trend of all subsequent French poetry, and he left, through his influence upon Dryden, Pope, and their contemporaries, a permanent mark upon English literature. For some time he held the post of historiographer

in connection with the Racine, and was elected academician in 1684, though only after the interference of the king in his favor. He died in 1711 of dropsy.

**Boiler** (boi'ler), a vessel constructed of wrought iron or steel plates riveted together, with needful adjuncts, in which steam is generated from water for the purpose of driving a steam-engine or for other purposes. The first important point in preparing a steam-boiler is to secure strength to resist the internal pressure of steam and prevent explosions; and accordingly the globular or spherical shape was very early adopted as one of greatest capacity, and as a shape which was not liable to distortion by pressure. It was set over an open fire, and the steam was confined until it was raised by the heat to the required pressure. But the open fire was wasteful of fuel, and the next step was to inclose the globular boiler in brickwork and conduct the flames in a flue winding round the boiler, in contact with it. The next form of boiler was the cylindrical, which stood upright like a bottle, the fire being placed at the bottom, and the flue winding round that part of the sides or walls of the boiler covered with water. For the sake of strength to resist the pressure of the steam, the bottom was hollowed or arched upwards, and it presented a concave dome to the radiant heat of the fire and the impact of the flames; and the top was made hemispherical. In process of time boilers of much larger size came to be required, and the horizontal wagon-shaped boiler was produced, and this was soon succeeded by the cylindrical boiler having hemispherical ends, in which simplicity and strength of design for higher pressures were combined.

For the sake of economy of fuel as well as of space, one or more cylindrical flues are commonly constructed within the boiler in all practical types of the present-day boiler. The burning gases from the fire, after having traversed the bottom of the boiler, return through the internal flue to the front, where the current is divided, and returns towards the chimney along both sides of the boiler. In the Cornish boiler, similarly constructed, the internal tube is made sufficiently large to receive the furnace inside the boiler; the boiler being 'internally fired,' in contrast with the other boilers which have been described, and are 'under-fired.' When two large furnace-tubes for internal firing are applied within the boiler it is known as the Lancashire boiler, and is the most generally prevailing type of boiler for purposes on land.

There are many varieties of boilers specially adapted to circumstances. The marine boiler now generally used is known as the Scotch boiler, consisting of a short horizontal cylindrical steel shell with flat end plates and provided with several internal furnaces in cylindrical flues communicating with internal combustion chambers fitted with a large number of return tubes above the flues. Locomotive boilers are constructed with the multitubular flue, and the furnace or firebox, surrounded with water, is placed at one end. There are many forms of upright or vertical boilers, consisting of upright cylindrical shells—containing a firebox at the lower part, from which the burned gases are carried up through a single vertical flue, or the multitubular flue, to the chimney above. In another form of upright boiler, cross water-tubes are inserted in the upper part of the furnace, which absorb heat, both radiated and convected, and promote the circulation of the water in the boiler. Efficiency of boilers has been greatly increased by various improvements and mechanical devices, among which may be mentioned the superheater, which raises the temperature of saturated steam; and the mechanical stoker, which insures uniform and economical firing by securing more perfect combustion, used as it is with the traveling link grate. A system of forced draught is also made use of for the consumption of low-grade fuel.

**Bois de Boulogne** (bwä dė bö-lōn), a pleasant grove near the gates on the west of Paris, so named after the suburb Boulogne-sur-Seine. Its trees were more or less destroyed during the Franco-German war, but others have grown since, and it is one of the pleasantest Parisian holiday promenades. Formerly it was a famous dueling ground.

**Boisé** (boi-zā, Fr. bwâ-zā), a city, the capital of Idaho, is on the Boisé River, in a rich mining and lumbering district. It is also in a well irrigated section and is a shipping point for wool, hides and fruit. Pop. 25,000.

**Bois-le-duc** (bwä-lė-dük; Dutch *Hertogenbosch*), a fortified city of North Brabant, Holland, founded by Godfrey of Brabant in 1184, at the point where the Dommel and Aa unite to form the Diest; has manufactures of cloth, hats, cotton goods, etc., and a good trade in grain, its water traffic being equal to that of a considerable maritime port. The fortifications are of little modern value, but the surrounding country can be readily inundated at need. The cathedral is one of the finest in the Netherlands. Pop. 44,034. The English were defeated here by the French in 1794.

**Boisserée** (bwäs-ra) GALLERY, a celebrated gallery of pictures in the Pinakothek or picture

gallery at Munich, collected by the brothers Sulpice (1783–1854) and Melchior Boisserée. In 1827 King Ludwig of Bavaria purchased it.

**Boissonade** (bwä-so-näd), JEAN FRANÇOIS, a French classical scholar, born in 1774; died in 1857. He became in 1809 assistant of Larcher as Greek professor of the Faculty of Letters in Paris, and four years afterwards he succeeded him both in the Faculty and in the Institute. In 1816 he was elected academician, and in 1828 was called to the chair of Greek literature in the College of France.

**Boissy d'Anglas** (bwä-sē däṅ-lä), FRANCOIS ANTOINE, COMTE DE, a French statesman of the revolutionary period, born 1756; died 1826. In 1789 he was elected at Annonay to the States-general, and in 1792 to the Convention. He voted against the death of Louis XVI, and after the fall of Robespierre was appointed secretary of the Convention, and entrusted with the provisioning of Paris at a time of famine. He was made a member of the Council of Five Hundred in 1795, president of the Tribunate in 1803, senator and commander of the Legion of Honor in 1805, and a peer by Louis XVIII in 1814.

**Bojador** (boj-a-dōr'), a cape on the west coast of Africa, one of the projecting points of the Sahara; till the fifteenth century the southern limit of African navigation.

**Bojol** (bo-*h*ol'), one of the Philippine Islands, north of Mindanao, about 40 m. by 30 m. Woody and mountainous. Pop. 243,148.

**Boker** (bō'ker), GEORGE HENRY, poet and dramatist, born at Philadelphia in 1823, became a lawyer, but never practised. In 1847 he published his first volume of poems, and next year his tragedy, *Calynos*, was successfully produced. He wrote other plays, the most famous of which is *Francesca Da Rimini*, often revived. Was author of a volume of patriotic poems written during Civil war. He died Jan. 2, 1890.

**Bokhara,** BOCHARA (bo-*h*ä'rä), a khanate of Central Asia, vassal to Russia, bounded north by Russian Turkestan, west by Khiva and the Transcaspian Territory of Russia, south by Afghanistan, and east by Chinese Turkestan; area about 93,000 square miles. The country in the west is to a great extent occupied by deserts; in the east are numerous ranges of mountains. Cultivation is mainly confined to the valleys of the rivers, the chief of which is the Oxus or Amoo Daria, forming the southern boundary and running close to the boundary on the west. The climate is warm in summer, but severe in winter; there is very little rain, and artificial irrigation is necessary. Besides cereals, cotton and tobacco are cultivated, and also a good deal of fruit. The total population, estimated at about 1,500,000, consists of the Usbek Tatars, who are the ruling race, and to whom the emir belongs; the Tajiks, who form the majority; Kirghiz, Turcomans, Arabians, Persians, etc. The only two towns of importance are the capital, Bokhara, and Karshi. The capital, according to Vámbéry the center of Tatar civilization, is behind the large towns of Western Asia in general luxury and comfort, though the country is distinguished from other countries of Central Asia by its numerous schools. The rule of the emir is theoretically absolute. The manufactures are unimportant, but there is a very considerable caravan trade, cotton, rice, silk, and indigo being exported, and woven goods, sugar, iron, etc., being imported. The trade has been greatly increased by the Russian Transcaspian railway, which crosses the country and reaches Samarkand, opening a market for the cotton and other products in Russia.

Bokhara was the ancient Sogdiana or Maracanda, capital Samarkand; was conquered by the Arabs in the 8th century, by Genghis Khan in 1220, and by Timur in 1370, and was finally seized by the Usbeks in 1505. It has recently suffered much from the advances of the Russians, who, in 1868, compelled the cession of Samarkand and important tracts of territory. Since then the Emir Muzaffer-Eddin has sunk more and more into a position of dependency on Russia. After the Russian expedition to Khiva in 1873 an agreement was come to between Russia and Bokhara by which Bokhara received a portion of the territory ceded by Khiva to Russia, while the Russians received various privileges in return. The khanate then came within the sphere of Russian domination. A Russian political agent was appointed and a Russian bank established at Bokhara, and the country was practically absorbed in Russian Turkestan, for what little power it had lapsed in 1884 on the annexation of Merv.—BOKHARA, the capital of the khanate, is 8 or 9 miles in circuit, and surrounded by a stone wall. The streets are narrow and the houses poorly built; principal edifices: the palace of the khan, crowning a height near the center of the town and surrounded by a brick wall 70 feet high; and numerous mosques, schools, bazaars, and caravansaries. The trade

was formerly large with India, but has been almost completely absorbed by Russia. Pop. about 70,000.

**Bolama** (bo-là'mâ). See *Bissagos.*

**Bolan** (bo-lân') Pass, a celebrated defile in the Hala Mountains, N. E. of Beluchistan, traversed by a railway connecting Quetta with Sind in India. It is about 60 miles long, hemmed in on all sides by lofty precipices, and in parts so narrow that a regiment could defend it against an army. Since 1879 the Bolan route has been under British control and there is a British fortress at Quetta. The crest of the pass is 5800 feet high.

**Bolas** (bō'las; that is, 'balls'), a form of missile used by the Paraguay Indians, the Patagonians, and especially by the Gauchos of the Argentine Republic. It consists of a rope or line having at either end a stone, ball of metal, or lump of hardened clay. When used it is swung round the head by one end, and then hurled at an animal so as to entangle its limbs.

**Bolbec** (bol-bek), a town of France, dep. Seine-Inférieure, on the Bolbec, 21 miles E. N. E. Havre. Has large cotton mills; also produces handkerchiefs, linen and woolen stuffs, lace, etc. Pop. 10,959.

**Bolchow** (bol'hof). See *Bolkhoff.*

**Bole** (bōl), an earthy mineral occurring in amorphous masses, and composed chiefly of silica with alumina, iron, and occasionally magnesia. It is of a dull yellow, brownish, or red color, has a greasy feel, and yields to the nail. In ancient times, under the name of Læmnian bole or earth, one variety of it had a place in the materia medica. At present the best known bole of commerce is a coarse pigment known as Berlin and English red.

**Bolero** (bo-lēr'ō), a popular Spanish dance of the ballet class for couples or for a single female dancer. The music, which is in triple measure, is generally marked by rapid changes of time, and the dancers usually accompany the music with castanets. The interest of these dances largely depends upon the pantomime of passion, which forms an essential part of them.

**Boletus** (bo-lē'tus), a genus of fungi, order Hymenomycetes, family Polyporei. The characters of the genus are: broad, hemispherical cap, the lower surface formed of open tubes, cylindrical in form, and adhering to one another. The tubes can be separated from the cap, and contain little cylindrical capsules, which are the organs of reproduction. Most of the species are globular. *Bolētus edūlis* has firm flesh and an agreeable nutty flavor, and is a considerable article of commerce in France, particularly around Bordeaux. Of the numerous other species of Boletus, many are edible, and one, *B. igniarius*, furnishes the German tinder, and is used as an external styptic.

**Boleyn** (bụl'in), Anne, second wife of Henry VIII of England, eldest daughter of Sir Thomas Boleyn and Elizabeth Howard, daughter of the Duke of Norfolk; born, according to some accounts, in 1507, but more probably about 1501. She attended Mary, sister of Henry, on her marriage with Louis XII, to France, as lady of honor, returning to England about 1522, and becoming lady of honor to Queen Catharine. The king, who soon grew passionately enamoured of her, without waiting for the

Anne Boleyn.

official completion of his divorce from Catharine, married Anne in January, 1533, having previously created her Marchioness of Pembroke. When her pregnancy revealed the secret, Cranmer declared the first marriage void and the second valid, and Anne was crowned at Westminster with unparalleled splendor. On Sept. 7, 1533, she became the mother of Elizabeth. She was speedily, however, in turn supplanted by her own lady of honor, Jane Seymour. Accusations of infidelity were made against her, and in 1536 the queen was brought before a jury of peers on a charge of treason and adultery. Smeaton, a musician, who was arrested with others, confessed that he had enjoyed her favors, and on May 17 she was condemned to death. The clemency of Henry went no further than the substitution of the scaffold for the stake, and

she was beheaded on May 19th, 1536. Whether she was guilty or not has never been decided; that she was exceedingly indiscreet is certain.

**Bolides** (bō'līdz), a name given to those meteoric stones or aerolites that explode on coming in contact with our atmosphere.

**Bolingbroke** (bol'ing-bruk), HENRY ST. JOHN, VISCOUNT, English statesman and political writer, born in 1678 at Battersea, London; educated at Eton and at Oxford, where he had a reputation both for ability and libertinism. In 1700 he married a considerable heiress, the daughter of Sir Henry Winchcomb, but they speedily separated. In 1701 he obtained a seat in the House of Commons, attaching himself to Harley and the Tories. He at once gained influence and became secretary of war in 1706, though he retired with the ministry in 1708. He continued, however, to maintain a constant intercourse with the queen, who preferred him to her other counselors, and on the overthrow of the Whig ministry in 1710, after the Sacheverell episode, he became one of the secretaries of state. In 1712 he was admitted to the House of Lords with the title of Viscount Bolingbroke, and in 1713, against much popular opposition, concluded the Peace of Utrecht. At this period the Tory leaders were intriguing to counteract the inevitable accession of power which the Whigs would receive under the House of Hanover; but shortly after the conclusion of the peace a contention fatal to the party broke out between the lord high treasurer (Harley, Earl of Oxford) and Bolingbroke. Queen Anne, provoked by Oxford, dismissed him, and made Bolingbroke prime minister, but died herself four days later. The Whig dukes at once assumed the power and proclaimed the elector king. Bolingbroke, dismissed by King George while yet in Germany, fled to France in March, 1715, to escape the inevitable impeachment by which, in the autumn of that year, he was deprived of his peerage and banished. James, the English *Pretender* invited him to Lorraine and made him his secretary of state, but dismissed him in 1716 on a suspicion of treachery. He remained for some years longer in France, where (his first wife having died) he married the Marquise de Villette, niece of Madame de Maintenon, occupying himself with various studies. In 1723 he was permitted to return to England, living at first retired in the country in correspondence with Swift and Pope. He then joined the opposition to the Walpole ministry, which he attacked during eight years in the *Craftsman* and in pamphlets with such vigor and skill that in 1735 a return to France became prudent, if not necessary. In 1742, on the fall of Walpole, he came back in the expectation that his allies would admit him to some share of power; but being disappointed in this respect, he withdrew entirely from politics and spent the last nine years of his life in quietude at Battersea, dying in 1751. He wrote in excellent and forcible style, his chief works being *A Dissertation upon Parties; Letters on the Spirit of Patriotism, on the Idea of a Patriot King,* and *On the State of Parties at the Accession of George I; Letters on the Study of History* (containing attacks on Christianity), and other works. Pope was indebted to him for suggestions for his *Essay on Man.* He was clever and versatile, but unscrupulous and insincere.

**Bolivar** (bo-lē'vär), SIMON (*El Libertador*), the liberator of Spanish South America, was born at Caracas, July 24, 1783. He finished his education in Europe, and having then joined the patriotic party among his countrymen he shared in the first unsuccessful efforts to throw off the Spanish yoke. In 1812 he joined the patriots of New Granada in their struggle and having defeated the Spaniards in several actions he led a small force into his own country (Venezuela), and entered the capital, Caracas, as victor and liberator, Aug. 4, 1813. But the success of the revolutionary party was not of long duration. Bolivar was beaten by General Boves, and before the end of the year the royalists were again masters of Venezuela. Bolivar next received from the Congress of New Granada the command of an expedition against Bogotâ, and after the successful transfer of the seat of government to that city retired to Jamaica. Having again returned to Venezuela he was able to rout the royalists under Morillo, and, after a brilliant campaign, effected in 1819 a junction with the forces of the New Granada republic. The battle of Bojaca which followed gave him possession of Santa Fé and all New Granada, of which he was appointed president and captain-general. A law was now passed by which the Republics of Venezuela and New Granada were to be united in a single state, as the *Republic of Colombia,* and Bolivar was elected the first president. In 1822 he went to the aid of Peru, and was made dictator, an office held by him till 1825, by which time the country had been completely freed from Spanish rule. In 1825 he visited Upper Peru, which formed itself into an independent republic named

*Bolivia*, in honor of Bolivar. In Colombia a civil war arose between his adherents and the faction opposed to him, but Bolivar was confirmed in the presidency in 1826, and again in 1828, and continued to exercise the chief authority until May, 1830, when he resigned. He died at Carthagena on the 17th December, 1830.—One of the states or departments of Colombia is named Bolivar after him.

**Bolivia** (bō-liv'i-a), originally called UPPER PERU, a republic of South America, bounded N. and E. by Brazil, S. by the Argentine Republic and Paraguay, and W. by Peru and Chile. Its area, according to recent estimates, is 708,195 sq. miles. As a result of the 1879–81 war with Chile, Bolivia ceded to that country her coast territory, covering about 29,000 sq. m., with a population of 22,000. The total pop. is 2,267,935. An unascertained proportion of the inhabitants belong to aboriginal races (the Aymaras and the Quichuas); the larger portion of the remainder being Mestizos or descendants of the original settlers by native women. The capital, formerly Sucre is now La Paz; other towns are Sucre or Chuquisaca, Potosi, Oruro, and Cochabamba. The broadest part of the Andes, where these mountains, encompassing Lakes Titicaca (partly in Bolivia) and Aullagas, divide into two chains, known as the Eastern and Western Cordilleras, lies in the western portion of the state. Here are some of the highest summits of the Andes, as Sorata, Illimani, and Sajama. The two chains inclose an extensive tableland, the general elevation of which is about 12,500 ft., much of it being saline and barren, especially in the south. The ramifications of the eastern branch extend a long way from the Cordillera, forming numerous valleys which pour their waters into the Pilcomayo, an affluent of the Paraguay, and into the Mamoré, Beni, and other great affluents of the Amazon. These spurs of the Eastern Cordillera are succeeded by great plains, in parts annually flooded to such a degree by the numerous rivers running through them that communication by boat is practicable for long stretches. In the southeast there is an extensive barren region with salt marshes. The waters of Lake Titicaca are conveyed to Lake Aullagas by the Desaguadero; the latter lake has only an insignificant outlet.

The climate, though ranging between extremes of heat and cold, is very healthy, and cholera and yellow fever are unknown. The elevated regions are cold and dry, the middle temperate and delightful, the lower valleys and plains quite tropical. Among animals are the llama, alpaca, vicuña, chinchilla, etc.; the largest bird is the condor. Bolivia has long been famed for its mineral wealth, especially silver and gold, the total value of these metals from the discovery of the mines in 1545 to the present time exceeds $3,000,000,000. The silver produce has fallen off greatly from past times and is now small. The celebrated Potosi was once the richest silver district in the world. The mining of tin became active in 1905, and this country in 1910 produced 40 per cent. of the world's yield of tin. Copper and nickel also are abundant. The country is capable of producing every product known to South America, but cultivation is in a very backward state. Coffee, coca, cacao, tobacco, maize, and sugarcane are grown, and there is an inexhaustible supply of India rubber. The imports and exports are roughly estimated at about $16,000,000 and $22,000,000, respectively. The chief exports are silver (two-thirds of the whole), cinchona or Peruvian bark, cocoa, coffee, caoutchouc, alpaca wool, copper, tin, and other ores. Roads are few and bad; and until these are improved and extended, railway construction carried on so as to communicate economically with the most important centers of industry, and the water communication by way of the Amazon and its tributaries taken advantage of, the trade must remain small. Accounts are kept in *bolivianos* or dollars, value from 40 to 48 cts.

By its constitution Bolivia is a democratic republic. The executive power is in the hands of a president elected for four years, and the legislative belongs to a congress of two chambers, both elected by universal suffrage. The finances are in a disorganized state; the revenue may amount to $5,500,000. The debt (1910) was $3,000,000. The religion is the Roman Catholic, and public worship according to the rites of any other church is prohibited. Education is at an exceedingly low ebb.

Bolivia under the Spaniards long formed part of the viceroyalty of Peru, at a later date it was jolned to that of La Plata or Buenos Ayres. Its independent history commenced with the year 1825, when the republic was founded. The constitution was drawn up by Bolivar, in whose honor the state was named Bolivia; and was adopted by Congress in 1826. It has since undergone important modifications. But the country has been almost continually distracted by internal and external troubles, and can scarcely

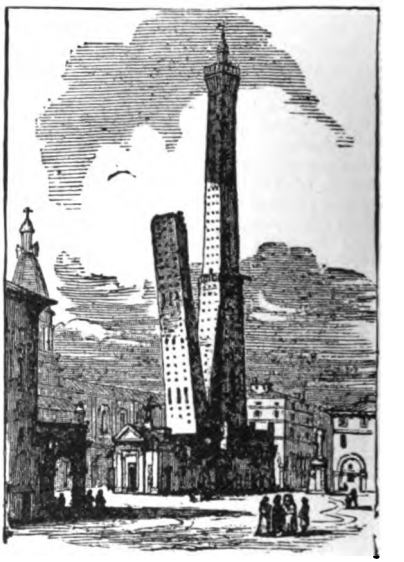
be said to have had any definite constitution. It suffered severely in the war which, with Peru, it waged against Chile in 1879 and subsequent years, and which ended in the loss of territory already mentioned; and has suffered from a frequent state of anarchy since the close of that war.

**Bolkhoff** (bol'hof), an ancient town of Russia, gov. of Orel; the industries embrace leather and hemp, hosiery, tallow, gloves, soap. Pop. 26,395.

**Boll Weevil** (bōl wē'vil), a small gray insect, the most serious pest of cotton in the United States. The damage done by the insect in 1907 was estimated at $10,000,000.

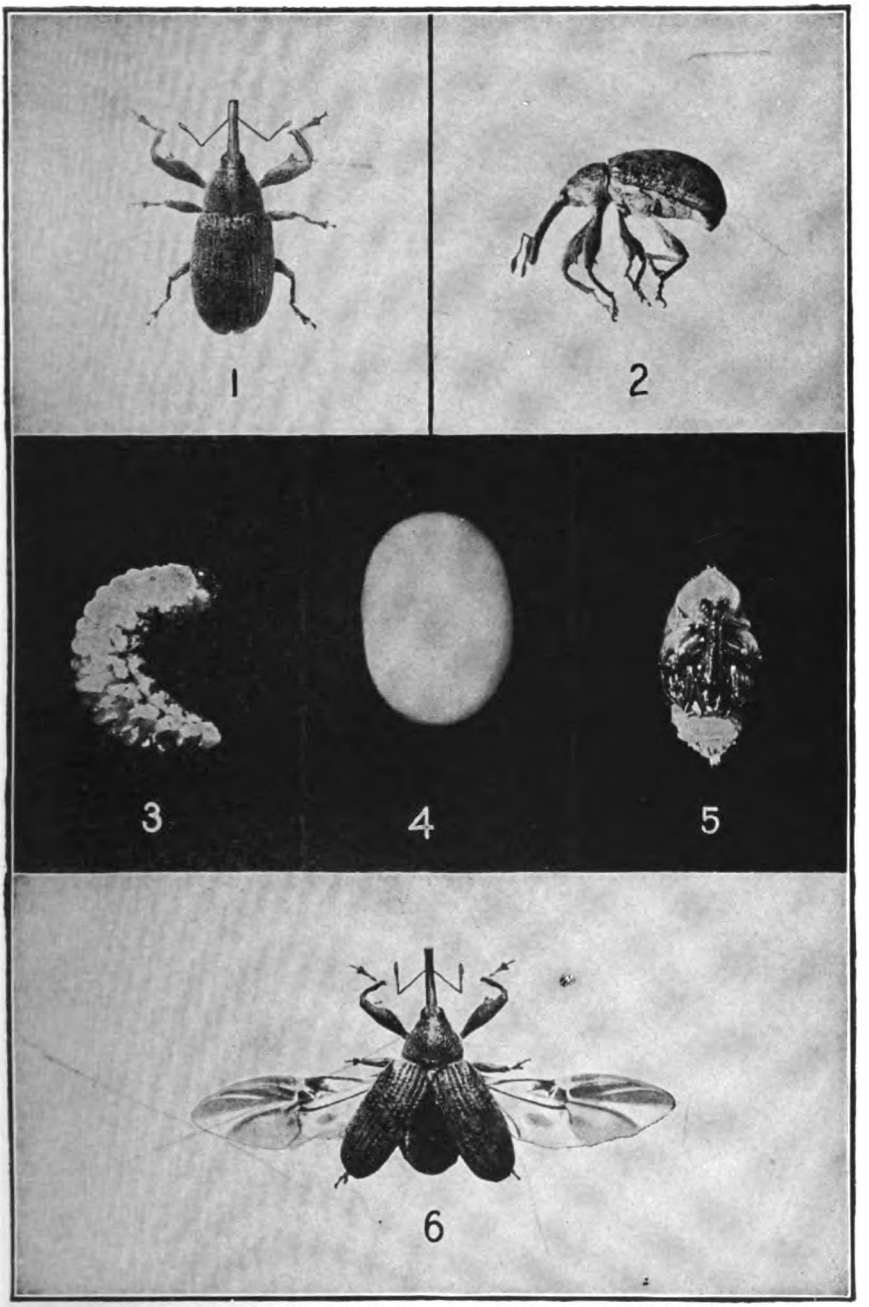
**Bollandists** (bol'lan-dists), the society of Jesuits which published the *Acta Sanctorum*, a collection of lives of the saints of the Roman Catholic Church. They received this name from John Bolland (d. 1665), who edited the first five volumes from materials already accumulated by Heribert Rosweyd, a Flemish Jesuit (d. 1629). The society was first established at Antwerp, removed to Brussels after the abolition of the society of Jesuits in 1773, and dispersed in 1794. A new association was formed in 1837 under the patronage of the Belgian government, and the publication of the *Acta Sanctorum* has been continued.

**Bologna** (bol-lōn'yȧ), one of the oldest, largest, and richest cities of Italy, capital of the province of same name, in a fertile plain at the foot of the Apennines, between the rivers Reno and Savena, surrounded by an unfortified brick wall. It is the see of an archbishop, and has extensive manufactures of silk goods, velvet, artificial flowers, etc. The older quarters are poorly and the modern handsomely built. There are colonnades along the sides of the streets affording shade and shelter to the foot-passengers. Among the principal buildings are the Palazzo Pubblico, which contains some magnificent halls adorned with statues and paintings; the Palazzo del Podestà; and the church or basilica of St. Petronio. Among the hundred other churches, S. Pietro, S. Salvatore, S. Domenico, S. Giovanni in Monte, S. Giacomo Maggiore, all possess rich treasures of art. The leaning towers, Torre Asinelli and Garisenda, dating from the 12th century, are among the most remarkable objects in the city; and the market is adorned with the colossal bronze *Neptune* of Giovanni da Bologna. An arcade of 640 arches leads to the church of Madonna di S. Lucca, situated at the foot of the Apennines, near Bologna, and the resort of pilgrims from all parts of Italy. Bologna has long been renowned for its university, said to have been founded in 1088, and having an attendance of students between 3000 and 5000 in the 12th to the 15th century, and in 1262 nearly 10,000, among them Dante and Petrarch. In 1564 Tasso was a student there, and in the 17th century, Malpighi, the great anatomist, was one of the school's professors. Among its faculty women have several times been numbered. The Academy of Fine Arts has a rich collection of paintings by native artists, such as Francia, and the later Bolognese school, of which the Caraccis, Guido Reni, Domenichino, and Albani were the found-



The Asinelli and Garisenda Towers, Bologna.

ers.—Bologna was founded by the Etruscans under the name of *Felsina*; became in 189 B.C. the Roman colony *Bononia*; was taken by the Longobards about 728 A.D.; passed into the hands of the Franks, and was made a free city by Charlemagne. In the 12th and 13th centuries it was one of the most flourishing of the Italian republics; but the feuds between the different parties of the nobles led to its submission to the papal see in 1513. Several attempts were made to throw off the papal yoke, one of which, in 1831, was for a time successful. In 1849 the Austrians obtained possession of it. In 1860 it was annexed to the dominions of King Victor Emmanuel. Pop. 172,628.—The province of BOLOGNA, formerly included in the




STAGES OF THE MEXICAN COTTON BOLL WEEVIL

Fig. 1.—Adult weevil, dorsal view. Fig. 2.—Adult weevil, side view. Fig. 3.—Full-grown larva, side view. Fig. 4.—Egg. Fig. 5.—Pupa, ventral view. Fig. 6.—Adult with wings spread. All except **Fig. 4, enlarged to 4 diameters; Fig. 4, enlarged 35 diameters.**

papal territories, forms a rich and beautiful tract; area 1450 sq. miles; pop. 527,367.

**Bologna,** GIOVANNI (prop. *Jean Bologne*), sculptor and architect, born at Douay in 1524, studied at Rome, and passed most of his life at Florence, where he died in 1608. Chief works: a marble *Rape of the Sabines*, and a bronze *Mercury*.

**Bologna Phial,** or VIAL, a small flask of unannealed glass, which flies into pieces when its surface is scratched by a hard body.

**Bologna stone,** a name for a variety or heavyspar or sulphate of barium.

**Bolometer** (bo-lom'e-tėr), a most sensitive electrical instrument invented by Langley in 1883 for the measurement of radiant heat.

**Bolor-Tagh** (bō'lor-tâg), also BILAUR, or BELUT TAGH, a mountain range of Central Asia between Eastern and Western Turkestan. It separates the Chinese Empire on the east from the lofty tableland of the Pamir, has a crest line 16,000–20,000 feet high and a peak estimated from 24,400 to 26,000.

**Bolsena** (bol'sā-nâ; ancient *Volsinii*, one of the twelve Etruscan cities), a walled town, Italy, province of Rome, on the N. side of a lake of the same name. The district yields a good wine. Pop. (1911) 3286.—The lake (ancient *Lacus Volsiniensis*) is 9 miles long, 7 miles broad, and 1000 feet above sea-level, and is well stocked with fish.

**Bolsheviki** (bol'she-vē'kē) or BOLSCHEVIKI, otherwise known as the *Maximalists*, a powerful group of the Social Democratic Party of Russia, who took control of affairs at the end of 1917 and concluded a peace treaty with the Quadruple Alliance (Germany, Austria-Hungary, Bulgaria and Turkey), with whom Russia had been at war since August, 1914. The Bolsheviki are the extreme radicals, as opposed to the *Menschiviki*, or *Minimalists*, who are of the moderate school to which Kerensky belonged. Under the Bolsheviki government, established in November, 1917, Nikolai Lenine was chosen premier, and Leon Trotzky foreign minister. The Ukrainian peoples in Little Russia refused to recognize the Bolshevik government and seceded, forming a separate republic. See *Russia, Ukrainia, Lenine, Trotzky, Kerensky*.

**Bolton** (bōl'ton), or BOLTON-LE-MOORS, a large manufacturing town and municipal and parliamentary borough of Lancashire, Eng. It contains some of the largest and finest cotton-mills in the world, the yarns spun being generally fine, and a great variety of fancy goods being produced, besides plain calicoes; while bleaching is also largely carried on. There are large engineering works, besides collieries, paper-mills, foundries, chemical works, etc. Numerous coal-pits in the vicinity add much to the prosperity of the town. Among the public buildings are one of the finest market-halls in England; a mechanics' institution, a noble building in the Romanesque style; the Chadwick Museum; and a town-hall, in the Grecian style, with a tower 220 feet high, fronting the spacious market-square. The free grammar-school of the town, founded in 1641, has two university exhibitions of £60 a year each. The Bolton Free Public Library, opened in 1853, contains about 50,000 vols. There are several parks and three recreation grounds. Pop. (1911) 180,885.

**Bolt-ropes,** ropes used to strengthen the sails of a ship, the edges of the sails being sewn to them. Those on the sides are called *leech-ropes*, the others *head-* and *foot-ropes*.

**Bolus** (bō'lus), a soft round mass of some medicinal substance larger than a pill, intended to be swallowed at once.

**Boma** (bō'ma), a trading station on the right bank of the lower Congo, and seat of government of the Congo State.

**Bomarsund** (bō'mar-sönd), a Russian fortress on the Aland Islands at the entrance of the Gulf of Bothnia, bombarded and forced to capitulate to the allied French and English in 1854 during the Crimean war, and then destroyed.

**Bomb** (bom), a large, hollow iron ball or shell, filled with explosive material and fired from a mortar. The charge in the bomb is exploded by means of a fuse filled with powder and other inflammable materials, which are ignited by the discharge of the mortar. Conical shells shot from rifled cannon have largely supplanted the older bomb. The use of bombs and mortars is said to have been invented in the middle of the 15th century.

**Bomba** (bom'ba), a nickname given to Ferdinand II of Naples, on account of his bombardment of Messina in 1848.

**Bombard** (bom'bârd), a kind of cannon or mortar formerly in use, generally loaded with stone instead of iron balls. Hence the term *bombardier*.

**Bombardier** (bom-bâr-dēr'), an artillery soldier whose special duties are connected with the loading

and firing of shells, grenades, etc., from mortars or howitzers. See *Bombard.*

**Bombardier Beetle,** a name given to beetles of the genera *Brachinus* and *Aptinus*, family Carabidæ, because of the remarkable power they possess of being able to defend themselves by expelling from the anus a pungent acrid fluid, which explodes with a slight report on coming in contact with the air.

**Bombardment** (bom-bard'ment), an attack with bombs or shells upon a fortress, town, or any position held by an enemy, generally carried out from the sea.

**Bombardon** (bom-bär'dun), a large musical instrument of the trumpet kind, in tone not unlike an ophicleide. Its compass is from F on the fourth ledger-line below the bass-staff to the lower D of the treble-staff. It is not capable of rapid execution.

Bombardon.

**Bombasin.** See *Bombazine.*

**Bombax.** See *Silk-cotton Tree.*

**Bombay** (bom-bā'; Portuguese 'good harbor'), the chief seaport on the west coast of India, and capital of the presidency of the same name. It stands at the southern extremity of the island of Bombay, and is divided into two portions, one known as the Fort, and formerly surrounded with fortifications, on a narrow point of land with the harbor on the east side and Back Bay on the west; the other known as the City, a little to the northwest. In the Fort are Bombay Castle, the government offices, and almost all the merchants' warehouses and offices; but most of the European residents live outside of the mercantile and native quarters of the town in villas or bungalows. Bombay has many handsome buildings, both public and private, as the cathedral, the university, the secretariat, the new high court, the post and telegraph offices, etc. Various industries, such as dyeing, tanning, and metalworking, are carried on, and there are large cotton factories. The commerce is very extensive, exports and imports of merchandise reaching a total value of over $300,000,000 annually. The harbor is one of the largest and safest in India, and there are commodious docks. There is a large traffic with steam-vessels between Bombay and Great Britain, and regular steam communication with China, Australia, Singapore, Mauritius, etc. The island of Bombay, which is about 11 miles long and 3 miles broad, was formerly liable to be overflowed by the sea, to prevent which substantial walls and embankments have been constructed. The harbor is protected by formidable rock-batteries. After Madras, Bombay is the oldest of the British possessions in the East, having been ceded by the Portuguese in 1661. Pop. 972,892.

**Bombay,** one of the three presidencies of British India, between lat. 14° and 29° N., and lon. 66° and 77° E. It stretches along the west of the Indian peninsula, and is irregular in its outline and surface, presenting mountainous tracts, low barren hills, valleys, and high tablelands. It is divided into a northern, a central, and a southern division, the Sind division, and the town and island of Bombay. Total area, 188,000 sq. m.; pop. 27,074,570, including the city and territory of Aden in Arabia, 70 sq. miles (pop. 44,079). The native or feudatory states connected with the presidency (the chief being Kathiawar) have an area of 69,045 sq. m. and a pop. of 8,059,298. The Portuguese possessions Goa, Damân,

and Diu geographically belong to it. Many parts, the valleys in particular, are fertile and highly cultivated; other districts are being gradually developed by the construction of roads and railroads. The southern portions are well supplied with moisture, but great part of Sind is the most arid portion of India. The climate varies, being unhealthy in Bombay, the capital and its vicinity, but at other places, such as Poonah, very favorable to Europeans. In 1896–97–98 the bubonic pestilence broke out and destroyed thousands of the natives. The chief productions of the soil are cotton, rice, millet, wheat, barley, dates, and the cocoa-palm. The manufactures are cotton, silk, leather, etc. The great export is cotton. The administration is in the hands of a governor and council. The chief source of revenue is the land, which is largely held on the ryotwar system.

**Bombazine** (bom-ba-zēn'), is a mixed tissue of silk and worsted, the first forming the warp and the second the weft. It is fine and light in the make, and may be of any color; it has now gone out of fashion.

**Bomb-ketch,** a kind of vessel formerly built for the use of mortars at sea in a bombardment. Bomb-ketches were usually of 100 to 150 tons burden, about 70 feet long, and had two masts. They were built very strong to sustain the violent shock produced by the discharge of the mortars, of which they generally carried two.

**Bombproof,** a military protective structure of such thickness and strength that bombs and shells cannot penetrate it. The stores and magazines in forts and other military erections are covered with earth and masonry and in some cases with thick armor-plate, to resist the fire of the most powerful siege guns and mortars.

**Bombshell.** See *Shell.*

**Bombyx** (bom'biks), the genus of moths to which the silkworm moth (*B. mori*) belongs.

**Bona** (bō'nà), a seaport and fortified city of Algeria, with manufactures of burnooses, tapestry, and saddles, and a considerable trade. Pop. (1906) 36,004.

**Bo'na De'a,** an ancient Roman goddess of fertility, described variously as the wife, sister or daughter of Faunus, and worshiped at Rome from the most ancient times, but only by women, even her name being concealed from men. Her sanctuary was a grotto on Mons Aventinus, but her festival (on May 1) was kept in the house of the consul, no males being permitted to attend, even portraits of men being veiled. The symbol of the goddess was a serpent, indicating her healing powers.

**Bonanza** (bō-nan'za), a Spanish term signifying 'prosperity,' or 'a fair wind.' It was first applied in the United States to the rich silver mines of Nevada; when a rich vein or pocket was discovered, yielding profitable ore, the mine was said to be in 'bonanza.' The term has come in somewhat common use to indicate successful enterprises generally.

**Bona Fides** (bō'na fī'dēz), BONA FIDE (Lat. 'good faith,' 'in good faith'), a term derived from the Roman jurists, implying the absence of all fraud or unfair dealing. A *bona fide* traveler in England and Scotland is one who actually travels three miles or more from home on Sunday and is therefore legally entitled to drink at a hotel.

**Bonaparte** (bō'na-pärt), the French form which the great Napoleon was the first to give to the original Italian name *Buonaparte*, borne by his family in Corsica. As early as the 12th and 13th centuries there were families of this name in Northern Italy, members of which reached some distinction as governors of cities (*podestà*), envoys, etc. But the connection between the Corsican Bonapartes and these Italian families is not clearly established, though probably the former descended from a Genoese branch of the family, which transplanted itself about the beginning of the 16th century to Corsica, an island then under the jurisdiction of Genoa. From that time the Buonaparte ranked as a distinguished patrician family of Ajaccio. About the middle of the 18th century there remained three male representatives of this family at Ajaccio, viz. the archdeacon Luciano Bonaparte, his brother Napoleon, and the nephew of both, Carlo, the father of the Emperor Napoleon I. Carlo or Charles Buonaparte, born 1746, studied law at Pisa University, and on his return to Corsica married Letizia Ramolino. He fought under Paoli for the independence of Corsica, but when further resistance was useless he went over to the side of the French, and was included by Louis XV amongst the 400 Corsican families who were to have rights in France as noble. In 1777 he went to Paris, where he resided for several years, procuring a free admission for his second son Napoleon to the military school of Brienne.

He died in 1785 at Montpellier. By his marriage with Letizia Ramolino he left eight children: Giuseppe, or Joseph (see below), king of Spain; Napoleon I, emperor of the French (see *Napoleon I*); Lucien (see below), prince of Canino; Maria Anna, afterwards called Elise, princess of Lucca and Piombino, and wife of Prince Bacciocchi (see *Bacciocchi*); Luigi, or Louis (see below), king of Holland; Carlotta, afterwards named Marie Pauline, Princess Borghese (see *Borghese*); Annunciata, afterwards called Caroline, wife of Murat (see *Murat*), king of Naples; and Girolamo, or Jerome (see below), king of Westphalia.

**Bonaparte** (bō'na pärt), CHARLES JOSEPH, grandson of King Jerome B. and his first wife, Elizabeth Patterson, of Baltimore; born in Baltimore, 1851; was graduated from Harvard Law School, 1874, and from that time practised law in his native city. Prominent reformer. On Board of Indian Commissioners in 1902; chairman of National Civil Service League in 1904; president of National Municipal League in 1905; appointed Secretary of the Navy by President Roosevelt in 1905, and was Attorney-General from December, 1906, to end of administration.

**Bonaparte,** JEROME, youngest brother of Napoleon I, was born at Ajaccio in 1784, and at an early age entered the French navy as a midshipman. In 1801 he was sent out on an expedition to the West Indies, but the vessel being chased by English cruisers, was obliged to put in to New York. During his sojourn in America Jerome Bonaparte became acquainted with Miss Elizabeth Patterson, the daughter of the president of the Bank of Baltimore, and though still a minor, married her in spite of the protests of the French consul on the 24th December, 1803. The emperor, his brother, whose ambitious schemes were thwarted by this marriage, after an ineffectual application to Pope Pius VII to have it dissolved, issued a decree declaring it to be null and void. After considerable services both in the army and navy, in 1807 he was created King of Westphalia, and married Catherine Sophia, Princess of Würtemburg. His government was not wise or prudent, and his extravagance and his brother's increasing exactions nearly brought the state to financial ruin. The battle of Leipzig put an end to Jerome's reign, and he was obliged to take flight to Paris. He remained faithful to his brother through all the events that followed till the final overthrow at Waterloo. After that, under the title of the Comte de Montfort, he resided in different cities of Europe, but in later years chiefly at Florence. After the election of his nephew, Louis Napoleon, to the presidentship of the French Republic, in 1848, he became successively governor-general of Les Invalides, a marshal of France, and president of the senate. He died in 1860. From his union with Miss Patterson only one son proceeded, Jerome, who was brought up in America, and married a lady of that country, by whom he had two sons, one serving as an officer in the French army during the Crimean war. The offspring of this marriage was not, however, recognized as legitimate by the French tribunals. Of Jerome Bonaparte's second marriage two children remained, Prince Napoleon Joseph, who assumed the name of Jerome, and the Princess Mathilde. From the marriage of Prince Napoleon, well known by the nickname 'Plon-Plon,' with Clotilde, daughter of King Victor Emmanuel of Italy, were born three children—Victor (born 18th July, 1862), Louis and Marie, the first of whom after the death of Napoleon III's son, the Prince Imperial, was generally recognized by the Bonapartist party as the heir to the traditions of the dynasty. Both had to leave France in 1886, a law being passed expelling pretenders to the French throne and their eldest sons.

**Bonaparte,** JOSEPH, the eldest brother of Napoleon I, was born in Corsica in 1768, educated in France at the College of Autun, returned to Corsica in 1785, on his father's death, studied law, and, practiced at Bastia, soon being elected councillor of the municipality of Ajaccio. In 1793 he emigrated to Marseilles, and married the daughter of a wealthy banker named Clary. In 1796, with the rise of his brother to fame after the brilliant campaign of Italy, Joseph began a varied diplomatic and military career. At length, in 1806, Napoleon, having himself assumed the imperial title in 1804, made Joseph King of Naples, and two years afterwards transferred him to Madrid as King of Spain. His position here, entirely dependent on the support of French armies, became almost intolerable. He was twice driven from his capital by the approach of hostile armies, and the third time, in 1813, he fled, not to return. After Waterloo he went to the United States, and lived for a time at Bordentown, New Jersey, assuming the title of Count de Survilliers. He subsequently went to England, finally repaired to Italy, and died at Florence in 1844.

**Bonaparte,** LETIZIA RAMOLINO, the mother of Napoleon I, and, after Napoleon's assumption of the imperial crown, dignified with the title of Madame Mère, was born at Ajaccio in 1750, and was married in 1764 to Charles Buonaparte. She was a woman of much beauty, intellect, and force of character. Left a widow in 1785, she resided in Corsica till her son became first consul, when an establishment was assigned to her at Paris. On the fall of Napoleon she retired to Rome, where she died in 1836.

**Bonaparte,** LOUIS, second younger brother of the Emperor Napoleon I, and father of Napoleon III, was born in Corsica in 1778. He was educated in the artillery school at Chalons, accompanied Napoleon to Italy and Egypt, and subsequently rose to the rank of brigadier-general. In 1802 he married Hortense Beauharnais, Josephine's daughter, and in 1806 was compelled by his brother to accep', very reluctantly, the Dutch crown. He exerted himself to promote the welfare of his new subjects, and resisted as far as in him lay the tyrannical interference and arbitrary procedure of his brother; but disagreeing with the latter in regard to some measures, he abdicated the throne in 1810 and retired to Grätz under the title of the Count of St. Leu. He died at Leghorn in 1846. He was the author of several works which show considerable literary ability.

**Bonaparte,** LUCIEN, Prince of Canino, next younger brother of Napoleon I, was born at Ajaccio in 1775. He emigrated to Marseilles in 1793, and having been appointed to a situation in the commissariat at the small town of St. Maximin in Provence, he married the innkeeper's daughter. Here he distinguished himself as a republican orator and politician, and was so active on this side that after Robespierre's fall he was in some danger of suffering as a partisan. His brother's influence, however, operated in his favor, and in 1798 we find him settled in Paris and a member of the newly-elected Council of Five Hundred. Shortly after Napoleon's return from Egypt in 1799 he was elected President of the Council, in which position he contributed greatly to the fall of the Directory and the establishment of his brother's power, on the famous 18th Brumaire (9th Nov.). Next year, as Napoleon began to develop his system of military despotism, Lucien, who still held to his republican principles and candidly expressed his disapproval of his brother's conduct, fell into disfavor and was sent out of the way as ambassador to Spain. Eventually, when Napoleon had the consulate declared hereditary, Lucien withdrew to Italy, settling finally at Rome, where he devoted himself to the arts and sciences, and lived in apparent indifference to the growth of his brother's power. In vain Napoleon offered him the crown, first of Italy and then of Spain; but he came to France and exerted himself on his brother's behalf, both before and after Waterloo. Returning to Italy, he spent the rest of his life in literary and scientific researches, dying in 1840. Pope Pius VII made him Prince of Canino. He was the author of several works, amongst which are two long poems. His eldest son, Charles Lucien Laurent Bonaparte, born in 1803, achieved a considerable reputation as a naturalist, chiefly in ornithology. He published a continuation of Wilson's *Ornithology; Iconografia della Fauna Italica; Conspectus Generum Avium*, etc. He died in 1857. Another son, Pierre (1815–81) led an unsettled and disreputable life, and became notorious in 1870 by killing, in his own house at Paris, the journalist Victor Noir, who had brought him a challenge. He got off on the plea of self-defense, but had to leave France.

**Bonaparte,** NAPOLEON. See *Napoleon.*

**Bonassus** (bon-as'us), a species of wild ox, the aurochs.

**Bonaventure** (bō-na-ven-tōr'), ST., otherwise John of Fidanza, one of the most renowned scholastic philosophers, was born in 1221 in the Papal States; became in 1243 a Franciscan monk; in 1253 teacher of theology at Paris, where he had studied; in 1256 general of his order, which he ruled with a prudent mixture of gentleness and firmness. In 1273 Gregory X made him a cardinal, and he died in 1274 while papal legate at the Council of Lyons. He was canonized in 1482 by Sixtus IV. His writings are elevated in thought and full of a fine mysticism, a combination which procured him the name of *Doctor Seraphicus.* He wrote on all the philosophical and theological topics of the time with authority, but best, perhaps, on those that touch the heart and imagination. Among his writings are *Itinerarium Mentis in Deum; Reductio Artium in Theologiam; Centiloquium;* and *Breviloquium.*

**Bond,** an obligation in writing to pay a sum of money, or to do or not to do some particular thing specified in the bond. The person who gives the bond is called the obligor, the person receiving

the bond is called the obligee. A bond stipulating either to do something wrong in itself or forbidden by law, or to omit the doing of something which is a duty, is void. No person who cannot legally enter into a contract, such as an infant, or a lunatic, can become an obligor, though such a person may become an obligee. No particular form of words is essential to the validity of a bond. A common form of bond is that on which money is lent to some company or corporation, and by which the borrowers are bound to pay the lender a certain rate of interest for the money. Goods liable to customs or excise duties are said to be *in bond* when they are temporarily placed in vaults or warehouses under a bond by the importer or owner that they will not be removed till the duty is paid on them. Such warehouses are called *bonded* warehouses (stores, etc.).

**Bonded Warehouse** a warehouse used for storing bonded goods—goods subject to duty on which duty has not been paid.

**Bondu, Bondou** (bon'dö), a country of Senegambia, West Africa, the center being in about lat. 14° N., long. 12° 30′ W. It has a luxuriant vegetation, magnificent forests, and is in many parts under good culture, producing large crops of cotton, millet, maize, indigo, tobacco, etc. The inhabitants are Foulahs. It is governed by a king, but is now under French control.

**Bone** (bōn), a hard material constituting the framework of mammalia, birds, fishes, and reptiles, and thus protecting vital organs such as the heart and lungs from external pressure and injury. In the fetus the bones are formed of cartilaginous (gristly) substance, in different points of which earthy matter—phosphates and carbonates of lime—is gradually deposited till at the time of birth the bone is partly formed. After birth the formation of bone continues, and, in the temperate zones, they reach their perfection in men between the ages of twenty and twenty-five. From this age till fifty they change but slightly; after that period they grow thinner, lighter, and more brittle. Bones are densest at the surface, which is covered by a firm membrane called the *periosteum;* the internal parts are more cellular, the spaces being filled with marrow, a fatty tissue, supporting fine blood-vessels. Bone consists of nearly 34 per cent organic material and of 66 per cent inorganic substances, chiefly phosphate, carbonate, and fluoride of lime, and phosphate of magnesium. The organic material is convertible into gelatin by boiling. It is this which makes bones useful for yielding stock for soup. The inorganic substances may be dissolved out by steeping the bone in dilute hydrochloric acid. Bones, from the quantity of phosphates they contain, make excellent manure. See *Bone Manure.*

**Bone-ash,** BONE-EARTH, the earthy or mineral residue of bones that have been calcined so as to destroy the animal matter and carbon. It is composed chiefly of phosphate of lime, and is used for making cupels in assaying, etc.

**Bone-bed,** in geology a bed containing numerous fragments of fossil bones, teeth, etc., as in the Rhætic formation in the southwest of England and the Ludlow bone-bed in the Silurian formation.

**Bone Black,** IVORY BLACK, or ANIMAL CHARCOAL, is obtained by heating bones in close retorts till they are reduced to small coarse grains of a black carbonaceous substance. This possesses the valuable property of arresting and absorbing into itself the coloring matter of liquids which are passed through it. Hence it is extensively used in the process of sugar-refining, when cylinders of large dimensions filled with this substance are used as filters. After a certain amount of absorption the charcoal becomes saturated and ceases to act. It has then to be restored by reheating or other methods. Bone-black has also the property of absorbing odors, and may thus serve as a disinfectant of clothing, apartments, etc.

**Bone-breccia** (brech'i-a), in geology, a conglomerate of fragments of bones and limestone, cemented into a solid mass of rock by calcareous matter, found in certain caverns in Derbyshire, Germany, etc.

**Bone-caves,** caverns containing deposits in which are embedded large quantities of the bones of animals (many of them extinct), dating from the Pleiocene or later geologic periods.

**Bone-dust,** bones ground to dust to be used as manure. See *Bone Manure.*

**Bone Manure,** one of the most important fertilizers in agriculture. The value of bones as manure arises chiefly from the phosphates and nitrogenous organic matters they contain; and where the soil is already rich in phosphates bone is of little use as manure. It is of most service therefore where the soil is deficient in this respect, or in the case of crops whose rapid

growth or small roots do not enable them to extract a sufficient supply of phosphate from the earth, turnips, for instance, or late-sown oats and barley. There are several methods for increasing the value of bones as manure, by boiling out the fat and gelatin, for instance, the removal of which makes the bones more readily acted on by the weather and hastens the decay and distribution of their parts, or by grinding them to dust or dissolving them in sulphuric acid, by which latter course the phosphates are rendered soluble in water. Bones have long been used as manure in some parts of England, but only in a rude, unscientific way. It was in 1814 or 1815 that machinery was first used for crushing them, and bone-dust and dissolved bones are now largely employed as manures. Before being utilized in agriculture they are often boiled for the oil or fat they contain, which is used in the manufacture of soap and lubricants.

**Boneset** (bōn'set), or THOROUGHWORT (*Eupatorium perfoliātum*), a useful annual plant, natural order Compositæ, indigenous to America, and easily recognized by its tall stem, 4 or 5 feet in height, passing through the middle of a large double hairy leaf, and surmounted by a broad flat head of light-purple flowers. It is much used as a domestic medicine in the form of an infusion, having tonic and diaphoretic properties.

**Bonfire** (bon'fīr), a large fire lighted out of doors in celebration of some important or momentous event.

**Bonham** (bon'am), a town, capital of Fannin Co., Texas, 77 miles N. E. of Dallas. It has cotton gins, oil and flour mills, etc. Pop. 5042.

**Bonheur** (bo-neur), ROSA, a distinguished French artist and painter of animals, born at Bordeaux 22d March, 1822. When only eighteen years old she exhibited two pictures, *Goats and Sheep* and *Two Rabbits* which gave clear indications of talent. After that time a long list of pictures, *Tillage in Nivernais* (1849), *The Horse Fair* (1853), *Haymaking* (1865), etc., made her name famous. Died May 25, 1899.

**Bonifacio** (bō-nē-fä'chō), a seaport in Corsica, on the strait of same name, which separates Corsica from Sardinia. Wine and oil are exported, and a coral fishery is carried on. Pop. 3594. The Strait of Bonifacio is 7 miles broad, and contains several small islands.

**Boniface** (bon'i-fas), the name of nine popes.—BONIFACE I. elected 418. He was the first to assume the title of the First Bishop of Christendom. He died 422.—BONIFACE II, elected 530, died in 532. He acknowledged the supremacy of the secular sovereign in a council held at Rome.—BONIFACE III, chosen 607, died nine months after his election.—BONIFACE IV, elected 608. He converted the Pantheon at Rome into a Christian church.—BONIFACE V, 619 to 625. He endeavored to diffuse Christianity among the English.—BONIFACE VI elected 896, died a fortnight after.—BONIFACE VII, elected 947, during the lifetime of Benedict VI, and therefore styled antipope. Expelled from Rome in 984, he returned and deposed and put to death Pope John XIV. He died 985.—BONIFACE VIII (1294–1303), Benedict Cajetan, one of the ablest and most ambitious of the popes. His idea was, like that of Gregory VII, to raise the papal chair to a sort of universal monarchy in temporal as well as spiritual things. In pursuit of this design he was engaged in incessant quarrels with the German emperors and King Philip of France. He was not, however, very successful. The excommunication which he launched against Philip of France met with no respect, and he was proceeding to lay all France under interdict when he was seized at Anagni by an agent of Philip and a member of the great Colonna family which Boniface had banished from Rome. After three days' captivity the people of Anagni rose and delivered him; but he died a month later, probably from the privations and agitation he had undergone. In 1300 Boniface instituted the jubilees of the church, which, at first centennial, afterwards every twenty-five years, became a great source of revenue to the papal treasury.—BONIFACE IX (1389–1404), elected during the schism in the church while Clement VII resided at Avignon. He made a liberal traffic of ecclesiastical offices, dispensations, etc., and lavished the treasures thus procured on his relations or on costly edifices—the fortification of the castle of St. Angelo, for instance, and the Capitol. He died in 1404.

**Boniface,** ST., the apostle of Germany, whose original name was Winfrid, was born in Devonshire in 680, of a noble Anglo-Saxon family. In his thirtieth year he took orders as a priest, and in 718 he went to Rome and was authorized by Gregory II to preach the gospel to the pagans of Germany. His labors were carried on in Thuringia, Bavaria, Friesland, Hesse, and Saxony, through all of which he traveled, baptizing thousands and consecrating churches. He afterwards erected bishoprics and or-

ganized provincial synods. In 723 he was made a bishop, and in 732 an archbishop and primate of all Germany. Many bishoprics of Germany, as Ratisbon, Erfurt, Paderborn, Würzburg, and others, and also the famous abbey of Fulda, owe their foundation to him. He was slain in West Friesland by some barbarians in 755, and was buried in the abbey of Fulda.

**Bonin** (bō-nēn'), or ARCHBISHOP ISLANDS, several groups of islands, North Pacific Ocean, belonging to Japan, and lying to the south of it. The largest is Peel Island, which is inhabited by some English, Americans, and Sandwich Islanders, who cultivate maize, vegetables, tobacco, and the sugar-cane. It is frequently visited by vessels engaged in whale-fishing, which obtain here water and fresh provisions.

**Bonito** (bo-nē'tō), a name applied to several fishes of the mackerel family, one of which, the bonito of the tropics, or stripe-bellied tunny (*Thynnus pelămys*), is well known to voyagers from its persistent pursuit of the flying-fish. It is a beautiful fish, steel-blue on the back and sides, silvery on the belly, with four brown longitudinal bands on each side. It is good eating, though rather dry. The *Auxis vulgăris* and *Pelămys sarda* also go under this name.

**Bonn** (bon), an important German town in the Rhenish provinces of Prussia, beautifully situated on the left bank of the Rhine, with magnificent promenades and prospects in the environs. It has some trade and manufactures, but is chiefly important for its famous university founded in 1777 by Elector Maximilian Frederick of Cologne. Enlarged and amply endowed by the King of Prussia in 1818, it is now one of the chief seats of learning in Europe, with a library of more than 300,000 volumes, an anatomical hall, mineralogical and zoological collections, museum of antiquities, a botanical garden, etc. Lange, Niebuhr, Ritschl, Brandis, and other names famous in science or literature are connected with Bonn, and Beethoven was born there. Bonn was long the residence of the Electors of Cologne, and finally passed into the hands of Prussia by the arrangements of the Congress of Vienna in 1815. Pop. (1905) 81,997.

**Bonner** (bon'nèr), EDMUND, an English prelate, was born about 1495, of obscure parentage. He took a doctor's degree at Oxford in 1525, and, attracting the notice of Cardinal Wolsey, received from him several offices in the church. On the death of Wolsey he acquired the favor of Henry VIII, who made him one of his chaplains, and sent him to Rome to advocate his divorce from Queen Catharine. In 1540 he was consecrated Bishop of London, but on the death of Henry (1547), having refused to take the oath of supremacy, he was deprived of his see and thrown into prison. He was freed, but again arrested, and died in prison, 1569.

**Bonner,** ROBERT, American editor and publisher, was born in Londonderry, Ireland, in 1829. An emigrant to the United States at an early age, he settled in Hartford, Connecticut, and later removed to New York. As editor and owner of the New York *Ledger*, a weekly periodical, he attained country-wide fame by the publication of stories and articles by the most noted men then living. Among contributors to the *Ledger* were Longfellow, Beecher, 'Fanny Fern' (Mrs. James Parton), Tennyson, Dickens, Bryant, Sylvanus Cobb and Edward Everett. He died in 1899.

**Bon'net,** a covering for the head, now especially applied to that worn by women. In England the bonnet was superseded by the hat as a head-dress two or three centuries ago, but continued to be distinctive of Scotland to a later period.

**Bonnet-piece,** a Scotch coin, so called from the king's head on it being decorated with a bonnet instead of a crown. It was struck by James V, and is dated 1539. Bonnet-pieces are very rare, and highly valued by antiquarians.

**Bonnet Rouge** (bo-nā-rōzh; Fr. 'red cap'), the emblem of liberty during the French Revolution, and then worn as a head-dress by all who wished to mark themselves as sufficiently advanced in democratic principles; also called *cap of liberty*.

**Bonneval** (bon-vâl), CLAUDE ALEXANDRE, COUNT, a singular adventurer, born in 1675 of an illustrious French family. In the war of the Spanish Succession he obtained a regiment, and distinguished himself by his valor as well as by his excesses. On his return to France he was obliged to fly in consequence of some expressions against the minister and Madame de Maintenon. Received into the service of Prince Eugene, he fought against his native country, and, after performing many signal services, was raised in 1716 to the rank of lieutenant field-marshal in the Austrian service, and distinguished himself against the Turks at Peterwardein. But his reckless and impatient spirit brought him into conflict with the superior authorities, and he finally took refuge in

Constantinople, where he was well received. He now professed conversion to Mohammedanism, submitted to circumcision, received the name of *Achmet*, was made a pasha of three tails, and as general of a division of the army achieved some considerable successes against Russians and Austrians. He died in 1747. The memoirs of his life published under his name are not genuine.

**Bonnivard** (bon-ē-vär), FRANÇOIS DE, was born at Seyssel, France, in 1496. He took the side of the Genevese against the pretensions of the Dukes of Savoy. In 1530 he fell into the hands of the duke, and was imprisoned till 1536 in the castle of Chillon, when the united forces of the Genevese and the Bernese took Chillon. He died at Geneva in 1570. He is the hero of Byron's 'Prisoner of Chillon,' and was the author of *A Chronicle of Geneva*.

**Bonpland** (bōn-plän), AIMÉ, a distinguished French botanist, born at Rochelle in 1773. While pursuing his studies at Paris he made the acquaintance of Alexander von Humboldt, and agreed to accompany him in his celebrated expedition to the New World. During this expedition he collected upwards of 6000 plants, previously unknown, and on his return to France in 1804 was made director of the gardens at Navarre and Malmaison. On the Restoration he proceeded to South America, and became professor of natural history at Buenos Ayres. Subsequently, while on a scientific expedition up the river Paraná, he was arrested by Dr. Francia, the dictator of Paraguay, as a spy, and detained for eight years. He afterwards settled in Brazil, where he died in 1858.

**Bontebok** (bon'te-bok), the pied antelope (*Alcelăphus pygarga*), an antelope of S. Africa, with white markings on the face, allied to the blesbok.

**Bonus** (bō'nus), something given over and above what is required to be given, especially an extra dividend to the shareholders of a joint-stock company, holders of insurance policies, etc., out of accrued profits.

**Bony Pike,** or GARFISH (*Lepidosteus*), a remarkable genus of fishes inhabiting North American lakes and rivers, and one of the few living forms that now represent the order of ganoid fishes, so largely developed in earlier geological epochs. The body is covered with smooth, enameled scales, so hard that it is impossible to pierce them with a spear. The common garfish (*L. osseus*) attains the length of 5 feet, and is easily distinguished by the great length of its jaws.

**Bonze** (bonz), the name given by Europeans to the priests of the religion of Fo or Buddha in Eastern Asia, particularly in China, Burmah, Tonquin, Cochin-China, and Japan. They do not marry, but live together in monasteries. There are also female bonzes, whose position is analogous to that of nuns in the Roman Catholic Church.

**Booby** (bö'bi; *Sula fusca*), a swimming bird nearly allied to the gannet, and so named from the extraordinary stupidity with which, as the older voyagers tell, it would allow itself to be knocked on the head without attempting to fly. The booby lives on fish, which it takes, like the gannet, by darting down upon them when swimming near the surface of the water.

**Boodha** (böd'a). See *Buddha*.

**Book,** the general name applied to a printed volume. In early times books were made of the bark of trees; hence the Latin *liber* means bark and book, as in English the words *book* and *beech* may be connected. The materials of ancient books were largely derived from the papyrus, a plant which gave its name to paper. The use of parchment, prepared from skins, next followed, until it was supplanted in Europe by paper in the 12th century, though paper was made in Asia long before this. Recent research has shown that the ancient Babylonians and Assyrians had a large and varied literature, reaching back to 3000 or 4000 years B.C. But they possessed no books in the modern sense, their volumes consisting of clay tablets, on which the text was impressed by wedge-shaped alphabetic stamps. Some of this work is so finely done that it needs a magnifying glass to read it. Such tablets, numbered, served as pages for their literary works. The use of papyrus to write upon began in Egypt, the ancient papyrus book being a long roll, written upon one side, and fastened to a wooden roller, round which it could be wound. Some of these rolls still exist, from more than 20 to even 40 yards long. The trouble of unrolling and reading these led to their being broken up into sections, each on a separate roll, and it was in this way the Greek and Roman papyrus manuscripts were prepared. When the art of paper-making was learned, and even with vellum, or parchment, it proved desirable to replace the rolled with the folded form, sometimes four sheets being folded in the middle and placed within each other, making a pamphlet of eight pages; sometimes five or six sheets being used, making ten or twelve pages. These were known re-

spectively as quaternions, quinternions or quinterns, and sexterns. In collecting a number of these to form a volume, marks are placed upon them to indicate their proper succession, thus leading to the modern custom of signatures on book sheets. When it became usual to print a certain number of pages at once, the paper was not folded and set up until it had passed through the press, the printed pages being so adjusted that they would come in proper succession when folded. For the method in which these sheets are made up into a book, see *Bookbinding*. In this way books have been made differing greatly in size. In addition to those of ordinary dimensions, varying from two to twelve or eighteen foldings, there are giants and dwarfs among books. Thus certain church books in the Escurial are said to be six feet long by four feet wide. The dwarfs have representatives in the 'Thumb-Bible,' not much bigger than a postage stamp; Pickering's Diamond edition of *Tasso*, 3½ inches long by 1⅞ inches wide; and an 1878 edition of the *Divina Commedia*, less than 2¼ by 1½ inches in measurement. See *Bibliography*, *Bookbinding*, *Book-trade*, *Printing*, etc.

**Book'binding**, the art of making up the sheets of a book into a volume with a substantial case or covering. In the middle ages the work of binding the manuscripts then used was done by the monks, in a heavy and very solid style. With the invention of printing, and the consequent multiplication of books, binding became a great mechanical art, in which the Italians of the 15th and 16th centuries took the lead. Later on the French binders enjoyed a well-deserved supremacy for delicate and elegant work. During the 19th century bookbinding continued to rank as a fine art, especially in France, where very fine and elaborate work was done. Artistic work was also done in England, and towards the end of the century the United States and Germany came into this field of art. The now common process of cloth or case binding was introduced in 1822, leather binding preceding it. The latter is performed as follows:—

The first operation in bookbinding is to fold the sheets—into two leaves if the book be folio; if quarto, into four leaves; octavo, eight leaves; and so of all others. After the sheets are folded, they are arranged in the proper order, according to the letters or figures, technically called *signatures*, which are printed at the bottom of the first page of each sheet. The collected sheets are pressed in a screw or hydraulic press for several hours, and the book being now firm and solid, shallow channels are sawed across the back in several places, in order to admit the cords to which the sheets are to be sewed and the boards fastened. The sewing is done by an ingenious sewing machine, which, like nearly all the machinery now employed in bookbinding, is of American invention. The back is then covered with a coating of glue, and when dry rounded with a hammer, and afterwards beaten till it projects a little over the boards that compress it, so that a groove is formed for the edges of the boards to rest in. The boards are then laced to the book by the ends of the cords on which the sheets are sewed. The book is then pressed again for several hours, to make it solid for cutting the edges, which is performed by a machine called a *plow* or guillotine. Before the front edge is cut the back is made flat, and after cutting it is again rounded, leaving the face hollow. When the book is cut it may either be gilt, marbled, sprinkled, or colored on the edges, or left white. In gilding, the edges are made perfectly smooth, then sized with white of egg mixed with water, and covered with the gold-leaf. After having dried, the gold is burnished with an agate burnisher. Marbling is done by dipping the edges slightly into the coloring mixture as it floats on the surface of gum-water. Sprinkling is performed with a brush, which the workman dips in color and shakes in small drops on the edges. After the head-band has been added the book is ready for the leather cover. The cover, after being damped with water, and having the rough side smeared with strong paste made of flour, is now pulled on, and doubled over the edges of the boards. The sides and edges are then neatly squared and smoothed, and the book is put for some hours into the press, after which it is ready for its ornaments and letters. The letters or ornaments on books are made with brass tools engraved in relief. A book is called *half-bound* or *half leather* when only the back and corners are leather.

The above description applies chiefly to the binding of books in leather, and in the strongest manner; but an immense number of books are now bound entirely in cloth, a style of binding which, though less strong, is cheaper and more expeditious, and often very handsome. The cloth covers or 'cases' are made up complete—embossed, gilt, and lettered—before being attached to the book, the ornaments being stamped upon them by presses acting on metal dies. The covers are usually attached by thin canvas glued to the backs,

as well as by the back-cords, or tapes used instead. A simpler method of binding is commonly practised in the case of engravings, atlases, manuscripts, etc., when the volumes are made up of separate leaves instead of sheets. It consists in smearing the back of the book, while placed in the press, with a solution of caoutchouc, by which means each paper edge receives a little of this tenacious substance, and all are firmly kept in their places. Such books open up quite flat at once.

**Book'keeping,** is the art or method of recording mercantile or pecuniary transactions, so that at any time a person may be able to ascertain the details and the extent of his business. It is divided, according to the general method pursued, into bookkeeping by *single* or by *double entry*. Bookkeeping by single entry is comparatively little used, except in retail businesses of small extent, where only the simplest record is required. In its simplest form debts due to the trader are entered in the daybook at the time of the transaction to the debit of the party who owes them; and debts incurred by the trader to the credit of the party who gave the goods. From this book the accounts in a summarized form are transferred to the ledger, where one is opened for each different person, one side being for Dr., and the other for Cr. When a balance-sheet of the debts owing and owned is made, this, together with stock and cash in hand, shows the state of the business.

Bookkeeping by double entry, a system first adopted in the great trading cities of Italy, gives a fuller and more accurate record of the movement of a business, and is necessary in all extensive mercantile concerns. The chief feature of double entry is its system of checks, by which each transaction is twice entered, to the Dr. side of one account and then to the Cr. side of another. An important feature of the system consists in adopting, in addition to the personal accounts of debtors and creditors contained in the ledger, a series of what are called *book-accounts*, which are systematic records in the form of debtor and creditor of particular classes of transactions. For every debt incurred some consideration is received. This consideration is represented under a particular class or name in the ledger, as the debtor in the transaction in which the party from whom the consideration is received is the creditor. Thus A buys goods to the value of $500 from B. He enters these in his journal—Stock Acct. Dr. $500 (for goods purchased). To B, $500. The first $500 appears in the Dr. column of the journal, and is posted in the ledger to the debit of Stock Account; the second appears in the Cr. column, and is posted in the ledger to the Cr. of B. In like manner, when the goods are paid, Cash, for which an account is opened in the ledger, is credited with $500, and B is debited with the same. When the goods are sold (for cash) Stock is credited and Cash is debited. If the amount for which they sell is greater than that for which they were bought, there will be a balance at the debit of Cash and a balance at the credit of Stock. The one balance represents the cash actually on hand (from this transaction), the other the cause of its being on hand. If there is a loss on the transaction, the balance will be on the other side of these accounts. Ultimately the balance thus arising at Dr. or Cr. of Stock is transferred to an account called Profit and Loss, which makes the stock account represent the present value of goods on hand, and the profit and loss account, when complete, the result of the business. In this system the risk of omitting any entry, which is a very common occurrence in single bookkeeping, is reduced to its smallest, as unless a particular transaction is omitted in every step of its history, the system will inexorably require that its whole history should be given to bring the different accounts into harmony with each other.

In keeping books by double entry, the books composing the set may be divided into two classes, called principal and subordinate books. The subordinate books are those in which the transactions are first recorded, and vary both in number and arrangement with the nature of the business and the manner of recording the facts. The most important of these (all of which are not necessarily to be found in the same set) are Stock Book, Cash Book, Bill Book, Invoice Book, Account Sales Book. The principal books are made up exclusively from the subordinate books and classified documents of the business. In the most perfect system of double entry they consist of two, the Journal and Ledger. The journal contains a periodical abstract of all the transactions contained in the subordinate books, or in documents not entered in books, classified into debits and credits. The ledger contains an abstract of all the entries made in journal classified under the heads of their respective accounts. It is an index to the information contained in the journal, and also a complete abstract of the actual state of all accounts, but gives no further information; while the journal gives the reason

of each debit and credit, with a reference to the source where the details of the transaction are to be found.

**Books,** CENSORSHIP OF, the supervision of books by some authority so as to settle what may be published. After the invention of printing the rapid diffusion of opinions by means of books induced the governments in all countries to assume certain powers of supervision and regulation with regard to printed matter. The popes were the first to institute a regular censorship. By a decree (*De Impressione Librorum*) of the Lateran council in 1515, no work was allowed to be printed without previous examination by ecclesiastical authority, the penalty of unlicensed printing being excommunication of the culprit and destruction of the books. In 1557 Pope Paul IV, through the Inquisition at Rome, published the first Roman *Index*, confirming the decree of the Council of Trent in 1546, containing the three classes of prohibited books, viz., authors condemned with all their writings; prohibited books whose authors are known; pernicious books by anonymous authors. In 1564 appeared with papal approval the *Index Librorum Prohibitorum*. The work of correcting the Index to date is in the hands of the 'Congregation of the Index,' which consists of several cardinals and a number of 'consultors' and 'examiners of books.' In England the censorship was established by act of parliament in 1662, but before that both the well-known Star-chamber and the parliament itself had virtually performed the functions. In 1694 the censorship in England ceased entirely. In France the censorship, like so many other institutions, was annihilated by the revolution. During the republic there was no formal censorship, but the supervision of the directory virtually took its place, and at length in 1810 Napoleon openly restored it under another name (Direction de l'Imprimerie). After the restoration it underwent various changes, and was re-established by Napoleon III with new penalties. In the old German empire the diet of 1530 instituted a severe superintendence of the press, but in the particular German states the censorship was very differently applied, and in Protestant states especially it has never been difficult for individual authors to obtain exemption. In 1849 the censorial laws were repealed, but were again gradually introduced, and still exist in a modified form. The censorship was abolished in Denmark in 1849, in Sweden in 1809, in the Netherlands in 1815. In Russia and Austria there is a despotic censorship. See *Press, Liberty of the.*

**Book Trade,** the production and distribution of books commercially. Even in ancient times, before the invention of printing, this trade had attained a high degree of development, at Alexandria and later at Rome, where Horace mentions the brothers Sosii as the chief booksellers of his time. Copies of books were readily multiplied by hand in those times, as we hear of as many as a thousand slaves being employed at one time in writing to dictation. After the fall of Rome down to the 12th century, the trade in books was almost entirely confined to the monasteries, and consisted chiefly in the copying of manuscripts and the barter or sale of the copies, generally at a very high price. But with the rise of the universities the trade received a new development, and in all university towns booksellers and book-agents became numerous. The invention of printing had a powerful effect on the trade of bookselling, as was first manifested in the commercial towns and free cities of the German empire. The printers were originally at the same time publishers and booksellers, and they were in the habit of disposing of their books at the chief market-towns and places frequented by pilgrims. It was only in the 16th century that these two branches of trade began generally to be carried on independently.

The two chief departments of the book trade now are publishing and bookselling by retail in all its branches, printing being regarded as a separate business. For the most part these two departments of the trade are carried on separately, but it is not uncommon for them to be united. The publisher of a book is the one who brings it before the public in a printed form, often purchasing the copyright, with the condition of publishing the work at his own risk; or the risk (profit or loss) may be shared between the author and publisher. Very frequently books are printed at the cost of the author or some learned society, and published on commission. In order to secure as large a sale as possible, the publisher brings himself into connection with the retail booksellers, who are the direct means of distributing the book to the public. Second-hand booksellers belong to a special department of the retail book trade, many of the books they deal in having been long out of print. In Britain the chief seat of the book trade is London, Edinburgh coming next (after a long interval); but publishing is also carried on to a considerable extent in Dublin, Manchester, Glasgow, and some other places. In France the center of the book trade is Paris, where almost all the books appear which make any pretensions

to occupy an important place in literature. The book trade of the United States, the chief seats of which are New York, Philadelphia, Boston, and Chicago, is very large. Canada and Australia are also developing an active business of this kind. The great center of the German book trade is at Leipzig, and the fair held in the latter city at Easter is the occasion on which all the accounts made in the book trade during the past year are settled. The common practice is for the booksellers to receive supplies of new books from the publishers on commission, with liberty to send back to the publisher all the copies that are not sold before the time of settlement at the Easter Fair (Ostermesse), or to carry over a part of them to next year's account if the sale has so far been unsuccessful. All business between the publishers and retail booksellers is carried on indirectly by means of commission agents, especially in Leipzig, but also in Berlin, Vienna, Frankfort, and other towns. Every bookseller out of Leipzig has his agent there, who conducts all his business, and is in constant communication with the other booksellers. A large number of the publishers deposit with their agents at Leipzig a stock of the works which they have published, and commission them to carry out all orders on their account. The retail bookseller sends all his orders to his agent, who communicates them to the Leipzig publishers and the agent of the other publishers. In Italy there is no central point either for the production of books or for the conduct of the trade by means of agents. Florence, Milan, and Turin hold nearly the same position.

In publishing new books, besides the expense of copyright, paper, presswork, etc., the publisher has to consider the number of presentation copies required for reviews, the percentage off the price allowed to the retail bookseller, in many cases also to the commission agent, and the expenses of advertising and making the work known to the public. The total number of works (including new editions) annually published in Germany reaches now the high total of 30,000; in France 10,000 to 12,000; in the United States and Great Britain it approaches 10,000 each. These figures do not afford a fair comparison, however, in the absence of any agreement as to what constitutes a book, some countries calling publications books which others would call pamphlets.

**Bookworm**, any insect grub which feeds on books, attracted either by the paper, ink, paste, or the leather of the binding. A considerable number of insects thus attack books. The name especially belongs to the larva of a species of anobium, a small beetle, and also to the larva of a small moth resembling the anobium. In the United States, though these bookworms are not present, others take their place, especially a small cockroach, the Croton bug (*Beatta Germania*). The title is applied derisively to men with whom poring over books is the chief interest in life.

**Boulac'**. See *Boulak*.

**Boole** (böl), GEORGE, an English mathematician and logician, born in 1815; died in 1864. A native of Lincoln and educated there, he opened a school in his twentieth year, and by private study gained such proficiency in mathematics that in 1849 he was appointed to the mathematical chair in Queen's College, Cork, where the rest of his life was spent. In 1857 the universities of Dublin and Oxford conferred on him the degrees of LL.D. and D.C.L., respectively. In mathematics he wrote on *Differential Equations; General Method in Analysis; The Comparison of Transcendents*, etc. In logic he wrote *An Investigation of the Laws of Thought*, and *The Mathematical Analysis of Logic*, a profound and original work, in which a symbolic language and notation were employed in regard to logical processes.

**Boom** (böm), a large pole or spar run out from various parts of a ship or other vessel for the purpose of extending the bottom of particular sails. Also a strong beam, or an iron chain or cable, fastened to spars extended across a river or the mouth of a harbor, to prevent an enemy's ships from passing.

**Boom** (böm), a town in Belgium, about 10 miles south of Antwerp. It has extensive brickyards, tanneries, etc. Pop. 15,863.

**Boomerang** (bö'me-rang), a missile instrument used by the Australian aborigines, and by some peoples of India, made of hard wood, about

Boomerangs.

the size of a common reaping-hook, and of a peculiar curved shape, sometimes resembling a rude and very open V. The boomerang, when thrown as if to hit

some object in advance, instead of going directly forward, slowly ascends in the air, whirling round and round to a considerable height, and returns to the position of the thrower. If it hits an object, of course it falls. The Australians are very dexterous with this weapon, and can make it go in almost any direction, sometimes making it rebound before striking.

**Boondee** (bön'dē), or BUNDI, a principality of Hindustan, in Rajputana, under British protection; area, 2300 square miles. Although small, Boondee is important from its position, as a medium of communication between the states. Pop. 171,277. Boondee, the capital, is picturesquely situated, and its antiquity, numerous temples, and magnificent fountains give it a very interesting appearance. Pop. 20,744.

**Boone** (bön), DANIEL, a pioneer of civilization, born in Pennsylvania in 1735; died in 1820. He crossed the Appalachian Mountains in 1769 to explore the little known region of Kentucky, and had many strenuous adventures with the Indians. In 1775 he built a fort on the Kentucky river, where Boonesborough now is, and settled there. In 1778 he was taken prisoner by the Indians, and was retained and adopted into the family of a Shawnee chief, but at length he effected his escape, and reached Boonesborough in time to save it from capture. He surpassed the Indians in their own arts. In the end of the century he removed from Kentucky into Missouri, where he died. From him a number of places in the United States take their names.

**Boone,** a city, capital of Boone County, Iowa; noted for coal and lumber. There are extensive deposits of potter's clay in its vicinity, and it has machine shops, brick and tile works, etc. Pop. 10,347.

**Boorhanpoor'.** See *Burhánpur.*

**Booro** (bö'rụ), one of the Molucca Islands in the Indian Archipelago, w. of Ceram and Amboyna, belonging to the Dutch. It is oval in shape, 92 miles long and 70 broad. Though mountainous and thickly covered with wood, it is productive, yielding rice, dyewoods, etc. Pop. 20,000.

**Booroojird** (bö-rö-jērd'), a town of Persia, province of Irakajemi, in a fertile and well-cultivated valley. It has a large trade in skins, etc. Pop. 20,000.

**Boossa.** See *Boussa.*

**Boot** (böt), an article of dress, generally of leather, covering the foot and extending to a greater or less distance up the leg. Hence the name was given to an instrument of torture made of iron, or a combination of iron and wood, fastened on to the leg, between which and the boot wedges were introduced and driven in by repeated blows of a mallet, with such violence as to crush both muscles and bones. The special object of this form of torture was to extort a confession of guilt from an accused person.

**Bootan.** See *Bhutan.*

**Bootes** (bo-ō'tēz; that is, ox-driver), the Greek name of a northern constellation, called also by the Greeks *Arctophylax.* It contains Arcturus, a star of the first magnitude.

**Booth** (böth), BALLINGTON, born at Brighouse, England, in 1859, son of William Booth (q. v.). He was commander of the Salvation Army in Australia (1885-87); in the United States (1887-96), and founded in 1896 the volunteers of America, a separate organization of the same character.

**Booth,** EDWIN THOMAS, an American actor, born at Bel Air, Maryland, in 1833, the son of the distinguished actor Junius Brutus Booth. He made his first appearance at Boston in 1849 and in 1851 he appeared as Richard III at the Chatham Square Theatre in New York, becoming eminent for his impersonation of Shakespearian characters. In 1852 he went West with his father, remaining for several years in California and going to Australia and the Sandwich Islands in 1854. In 1856 he returned to the Eastern States and after a notable southern tour made a great success in Boston and New York as Sir Giles Overreach. In 1860 he married Mary Devlin, who died in 1863. In 1861 he went to London and was extremely successful in the rôle of Richelieu. Returning to New York he acquired control of the Winter Garden and produced Shakespearian plays with marked success. In 1869 he married Mary McVicker who died in 1881. In 1869 he opened a theater of his own in New York, which was badly managed and proved a disastrous failure. In 1888 he founded the Players' Club, to which he gave a sumptuous clubhouse. He died in 1893.—His father, JUNIUS BRUTUS BOOTH, an English tragedian, (born in London in 1796, died in 1852), was an actor of eccentric character but of great ability, especially distinguished in the part of *Richard III.* Most of his life was spent in the United States.—The second son, JOHN WILKES (born 1839), also an actor, was the murderer of President Lincoln, April 14,

1865. He was shot by those trying to arrest him.

**Booth,** WILLIAM, founder and general of the Salvation Army, born at Nottingham, England, April 10, 1829; died August 20, 1912. He was a minister of the Methodist New Connection (1850–61), and began evangelistic work in London in 1865. Under his guidance the Salvation Army, for years the subject of ridicule, became a powerful organization, with branches in every civilized country. See *Salvation Army.*

**Booth,** WILLIAM BRAMWELL, son of William, born in Halifax, England, March 8, 1856. He was educated privately, and from 1874 on took an important part in the work of the Salvation Army. He was nominated as general by his father, and succeeded the latter upon his death in 1912.

**Boothia Felix** (bō'thi-a fē'liks), a peninsula of British North America, stretching northwards from the Arctic circle, discovered by Captain Ross in 1830. In the west coast of this country Ross located the north magnetic pole.

**Bopp** (bop), FRANZ, a distinguished German Sanskrit scholar and philologist, born at Mainz, in 1791; died at Berlin in 1867. He contributed much to the study of Sanskrit in Europe, and raised philology to the rank of a science. His most important work in the field was his *Comparative Grammar of Sanskrit, Zend, Greek, Latin, Gothic, old Slavonic, and German.*

**Boracic Acid** (bō-ras'ik), BORIC ACID, a compound of boron with hydrogen and oxygen ($H_3BO_3$). Boracic acid is found as a saline incrustation in some volcanic regions, is an ingredient in many minerals, and is contained in the steam which, along with sulphurous exhalations, issues from fissures in the soil in Tuscany. The steam from the *fumaroles* here is now an important source of the acid, a system of condensation and evaporation being employed. The acid forms white, shining, scaly crystals, which on heating melt into a transparent mass. The chief use of the acid is as a source of borax, the biborate of sodium. See *Borax.*

**Borage** (bor'aj; *Borāgo*), a genus of plants belonging to the nat. order Boraginaceæ, having rough, hairy foliage and blue, panicled, drooping flowers, and characterized by mucilaginous and emollient properties. *Borāge officinālis,* a common plant, gives a coolness to beverages, and was ranked formerly as one of the cordial flowers.

**Boraginaceæ** (bor-a-jin-ā'se-ē), the Borage family, a natural order of regular-flowered monopetalous dicotyledons, with alternate rough leaves, containing a large number of herbs or shrubs chiefly found in the northern temperate regions, among them being borage, alkanet, comfrey, and forget-me-not.

**Borassus** (bo-ras'us). See *Palmyra Palm.*

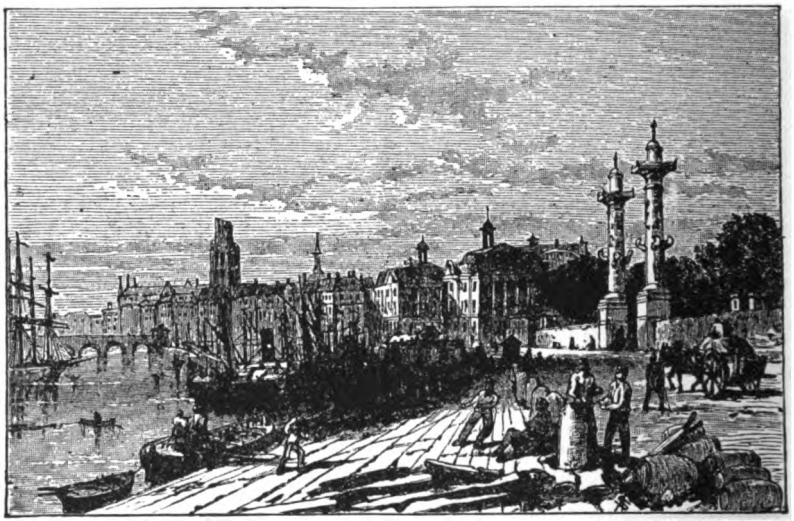
**Borax** (bōr'aks), biborate of sodium ($N_2B_4O_7$). Native borax has long been obtained under the name of *tincal,* from India, the main source being not India but a series of lakes in Tibet. As imported it is in small pieces of a dirty yellowish color, and is covered with a fatty or soapy matter. Tincal, which contains various impurities, was formerly the only source of borax; but besides Tuscany other sources of boracic acid, more particularly in North and South America, and the salt mines at Stassfurt, etc., in Germany, have been rendered available. North America yields large quantities, there being rich deposits of borax and boracic minerals on the Pacific slope. Pure borax forms large, transparent, six-sided prisms, which dissolve readily in water, effloresce in dry air, and when heated melt in their water of crystallization, swell up, and finally fuse to a transparent glass. Borax has a variety of uses. In medicine it is employed in ulcerations and skin diseases. It has valuable antiseptic and disinfecting properties, and has been used for the preservation of meat, fish, and milk, which practice is reprehensible. It is also employed in soldering metals, and in making fine glaze for porcelain, as it renders the materials more fusible. It is used in enameling, and in making beads, glass, and cement. See *Boracic Acid.*

**Borchgrevink** (bork'gre-vink), CARSTEN E., Antarctic explorer, born at Christiania, Norway, in 1864. On a whaling voyage in 1894–98 he made observations in the far south, and in Aug., 1898, sailed for the Antarctic seas in command of the *Southern Cross.* The expedition resulted in a sledge journey to 78° 50′ south latitude, the farthest south to that date. He also located the south magnetic pole at approximately 72° 40′ S. lat. and 152° 30′ E. lon.

**Borda** (bor-dȧ), JEAN CHARLES, a French mathematician and physicist, born at Dax in 1733; died in 1799. He served in the army and navy, and distinguished himself by the introduction of new methods and instruments connected with navigation, geodesy, astronomy, etc., being in particular the inventor of the reflecting circle. He was

one of the men of science who framed the metric system of weights and measures adopted in France.

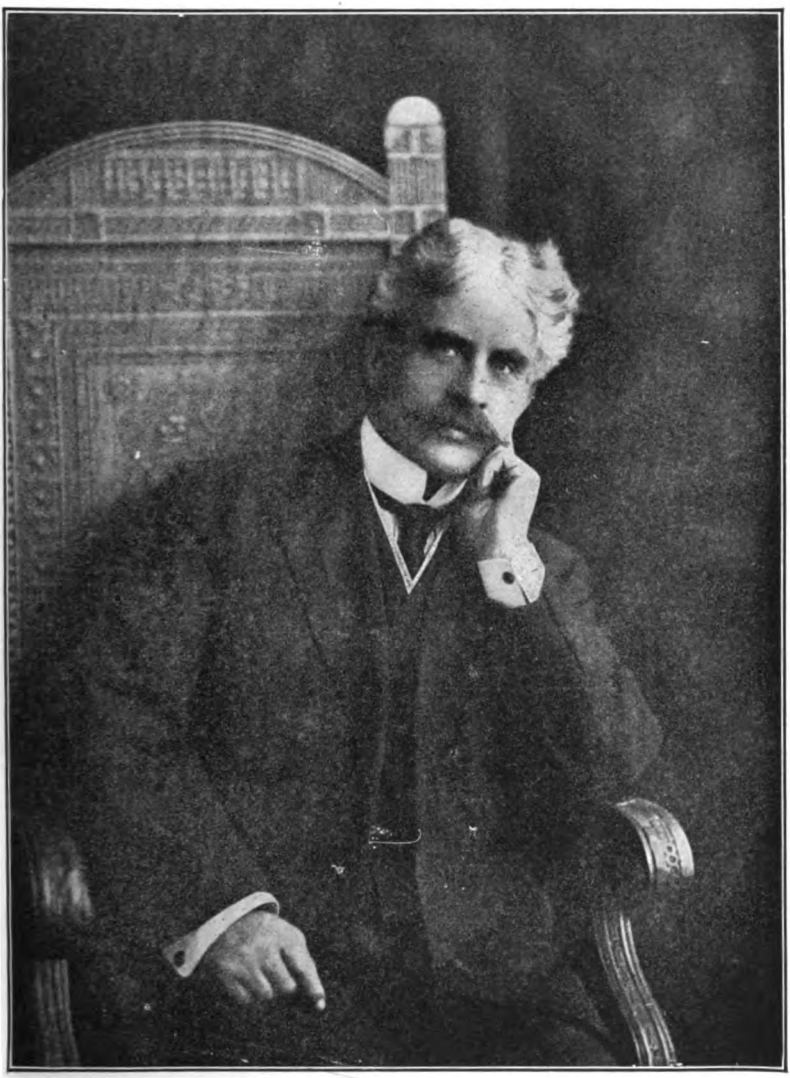
**Bordeaux** (bor-dō), one of the most important cities and ports of France, capital of the dep. of Gironde, on the Garonne, about 70 miles from the sea. It is built in a crescent form round a bend of the river, which is here lined with fine quays and crossed by a magnificent stone bridge, and consists of an old and a new town. The former is chiefly composed of irregular squares and narrow, crooked streets; while the latter is laid out with great regularity, and on a scale of magnificence hardly surpassed by any provincial town in Europe. In the old town are the Cathedral of Saint-André, St. Michael's Church, with its superb front of florid Gothic, the Hôtel de Ville, and the Palais de Justice. There are extensive and finely-planted promenades. Its position gives it admirable facilities for trade, and enables it to rank next after Marseilles and Havre in tonnage. Large vessels sail up to the town, and there is ready communication by railway or river with the Mediterranean, Spain, and the manufacturing centers of France. The chief exports are wine and brandy; sugar and other colonial produce and wood are the chief imports. Shipbuilding is the chief industry, and there are sugar-refineries, woolen and cotton mills, potteries, soapworks, distilleries, etc. Bordeaux is the *Burdigala* of the Romans. By the marriage of Eleanor, daughter of the last Duke of Aquitaine, to Henry II of England, Bordeaux was transferred to the English crown. Under Charles VII in 1451, it was restored again to France. Montaigne and Montesquieu were born in the neighborhood. Pop. (1915) 261,678.



Bordeaux—Quay of Louis XVIII.

**Bordeaux Mixture** (bor-dō′), the best known and most widely used fungicide, composed of copper sulphate, lime and water, in varying proportions. The original formula is 16 lbs. copper sulphate, dissolved in 22 gals. water, and 30 lbs. lime dissolved in 6 gals. water. The two solutions when cool are mixed slowly and thoroughly. This mixture is too strong for some purposes and modified formulas have been substituted.

**Bordelais** (bōrd-lā), WINES, the wines of Bordeaux and district, the name of *vin de Bordeaux* being generally given to the wines made in the eleven departments of the southwest of France, Gironde, Landes, Lot, Tarn et Garonne, etc., though it is in the Gironde that the most famous are produced. Besides the red wines of the Bordelais, known under the general name of *claret*,



SIR ROBERT LAIRD BORDEN, P.C., K.C., M.P.

there are also white wines, of which the finest growths are Sauterne, Preignac, Barsac, etc.

**Borden,** Robert Laird, the Canadian statesman, was born in Grand Pré, Nova Scotia, in 1854. He was admitted to the bar in 1878 and elected a member of the House of Commons for Halifax in 1896. He has taken a leading part in Canadian politics and was chosen leader of the Conservative Opposition upon the resignation of Sir Charles Tupper. He defeated Sir Wilfrid Laurier upon the reciprocity issue and became Prime Minister of Canada in 1911. He received the honor of Knighthood in 1914. Again in 1917 he defeated Sir Wilfrid Laurier in a general election which followed the latter's manifesto declaring for the suspension of the Military Service Act.

**Bordentown** a manufacturing town of New Jersey, on the Delaware, 26 miles N. E. of Philadelphia. It contains several advanced educational institutions. Joseph Bonaparte, brother of Napoleon, resided here for some years. Pop. 4250.

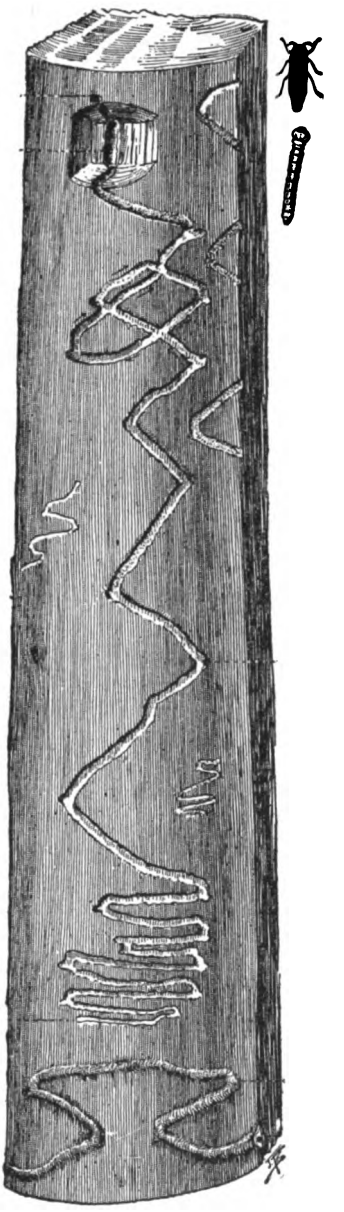
**Bordone** (bor-dō'nā), Paris, an Italian painter of the Venetian school, born at Treviso in 1500; died at Venice in 1570. He was a pupil of Titian, and was invited to France by Francis I, whose portrait he painted, as also those of the Duke of Guise, the Cardinal of Lorraine, and others. His works are not rare in the public and private collections of Europe, his most famous picture being the *Old Gondolier Presenting a Ring to the Doge*, at Venice.

**Bore** (bōr), or Eagre, a sudden influx of the tide into the estuary of a river from the sea, the inflowing water rising to a considerable height and advancing like a wall against the current. The most celebrated bores in the Old World are those of the Ganges, Indus, and Brahmaputra. The last is said to rise to a height of 12 feet. In some rivers in Brazil it rises to the height of 12 to 16 feet. In Britain the bore is observed more especially in the Severn, Trent, Wye, and Solway.

**Boreas** (bō'rē-as), the name of the north wind as personified by the Greeks and Romans.

**Borecole** (bōr'kōl), a variety of *Brassica oleracea*, a cabbage with the leaves curled or wrinkled, and having no disposition to form into a hard head.

**Borer,** a name given to the larvæ of certain insects which bore holes in trees and thus injure them.



Work of the Bronze Birch *Borer*, showing Insect and Larva.

**Borgerhout** (bor'ger-hout), a Belgian town, forming a suburb of Antwerp, with bleaching and dyeing works, and woolen manufactories, etc. Pop. 37,963.

**Borghese** (bor-gā'ze), a Roman family, originally of Sienna, where it held the highest offices from the middle of the 15th century. Pope Paul V, who belonged to this family, and ascended the papal chair in 1605, loaded his relations with honors and riches. He bestowed, among other gifts, the principality of Sulmone on Marco Antonio Borghese, the son of his brother Giovanni Battista, from whom is descended the present Borghese family.—BORGHESE, CAMILLO, PRINCE, was born in 1775; died in 1832. When the French invaded Italy he entered their service, and in 1803 he married Marie Pauline, the sister of Napoleon (born at Ajaccio 1780, died at Florence 1825). In 1806 he was created Duke of Guastalla, and was appointed governor-general of the provinces beyond the Alps. He fixed his court at Turin, and became very popular among the Piedmontese. After the abdication of Napoleon he broke up all connection with the Bonaparte family, and separated from his wife. The *Borghese Palace* at Rome was begun in 1590, and completed by Paul V. It contains one of the richest collections of art in the city. The *Villa Borghese*, a celebrated country-house just outside the Porta del Popolo, Rome, belonging to the Borghese family, also contains a valuable art collection, and the surrounding grounds are very beautiful.

**Borgia,** CESARE (che'zâ-re bor'jà), the natural son of Pope Alexander VI, and of a Roman lady named Vanozza, born in 1478. He was raised to the rank of cardinal in 1492, but afterwards divested himself of the office, and was made Duc de Valentinois by Louis XII. In 1499 he married a daughter of King John of Navarre, and accompanied Louis XII to Italy. He then, at the head of a body of mercenaries, carried on a series of petty wars, made himself master of the Romagna, attempted Bologna and Florence, and had seized Urbino when Alexander VI died, 1503. He was now attacked by a severe disease, at a moment when his whole activity and presence of mind were needed. He found means, indeed, to get the treasures of his father into his possession, and assembled his troops in Rome; but enemies rose against him on all sides, one of the most bitter of whom was the new pope, Julius II. Borgia was arrested and carried to Spain. He at length made his escape to his brother-in-law, the King of Navarre, and was killed before the castle of Viana, March 12, 1507. He was charged with the murder of his elder brother, of the husband of his sister Lucretia, and with the free use of the stiletto or secret poisoning against those who stood in his way. With all his reputed crimes he was a patron of art and literature.

**Borgia,** LUCRETIA, daughter of Pope Alexander VI, and sister of Cesare Borgia. In 1493 she was married to Giovanni Sforza, lord of Pesaro, but after she had lived with him for four years, Alexander dissolved the marriage, and gave her to Alphonso, nephew of Alphonso II of Naples. Two years after this new husband was assassinated by the hired ruffians of Cesare Borgia. Her third husband was Alphonso d'Este, son of the Duke of Ferrara. She was accused by contemporaries of incest, poisoning, and almost every species of enormous crime; but several modern writers defend her, maintaining that the charges which have been made against her are false or much exaggerated. She was a patroness of art and literature. Born in 1480, she died in 1519.

**Borgo** (bor'gō), Ital. for 'town' or 'castle,' occurs as part of the names of many places in Italy. One of the most important is *Borgo San Donnino*, a cathedral city of Parma, with a pop. of 6346.

**Bor'gu** (bor-gū'), a district of Africa in the Western Sudan, lying about lat. 10° N., and stretching from the meridian of Greenwich east to the Niger. Kiama and Wawa are chief towns.

**Boring,** the process of perforating wood, iron, rocks, or other hard substances by means of instruments adapted to the purpose. For boring wood the tools used are *awls*, *gimlets*, *augers*, and *bits* of various kinds, the latter being applied by means of a crank-shaped instrument called a *brace*, or else by a lathe, transverse handle, or drilling machine. Boring in metal is done by *drills* or *boring bars* revolved by boring machines. Boring in the earth or rock for mining, geologic, or engineering purposes is effected by means of augers, drills, or jumpers, sometimes wrought by hand, but now usually by machinery driven by steam or frequently by compressed air. In ordinary mining practice a bore-hole is usually commenced by digging a small pit about 6 feet deep, over which is set up a shear-legs with pulley, etc. The boring rods are from 10 to 20 feet in length, capable of being jointed together by box and screw, and

having a chisel inserted at the lower end. A lever is employed to raise the bore-rods, to which a slight twisting motion is given at each stroke, when the rock at the bottom of the hole is broken by the repeated percussion of the cutting tool. Various methods are employed to clear out the triturated rock. The work is much quickened by the substitution of steam-power, water-power, or even horse-power for manual labor. Of the many forms of boring machines now in use may be mentioned the diamond boring machine, invented by Leschot, a Swiss engineer. In this the cutting-tool is of a tubular form, and receives a uniform rotatory motion, the result being the production of a cylindrical core from the rock of the same size as the bore or caliber of the tube. The boring bit is a steel thimble, about 4 inches in length, having two rows of Brazilian black diamonds firmly embedded therein, the edges projecting slightly. The diamond teeth are the only parts which come in contact with the rock, and their hardness is such that an enormous length can be bored with but little appreciable wear.

**Borissoglebsk** (bo-rē-so-glepsk'), a town of Russia, gov. Tambov; a place of active trade. Pop. 22,370.

**Borissov** (bo-rē'sov), a Russian town, gov. Minsk. Not far from it took place the disastrous passage of the Berezina by the French in 1812. Pop. 14,931.

**Borkum** (bōr-kụm), a flat sandy island in the North Sea, near the coast of Hanover, off the estuary of the Ems, belonging to Prussia, a favorite resort for sea-bathing. The town of Borkum had a pop. in 1900 of 2114.

**Borlase** (bōr'las), WILLIAM, an English writer, born in Cornwall in 1695; died in 1772. He studied at Oxford, entered into orders, and became successively rector of Ludgvan and vicar of St. Just. In 1754 he published *Antiquities of Cornwall*, and in 1758 *Natural History of Cornwall*.

**Bormio** (bor'me-o), a small town of N. Italy, prov. Sondrio, with celebrated warm mineral springs. Pop. about 2000.

**Born,** BERTRAND DE, a French troubadour and warrior, born about the middle of the 12th century in the castle of Born, Périgord; died about 1209. He dispossessed his brother of his estate, whose part was taken by Richard Cœur de Lion in revenge for De Born's satirical lays. Dante places him in the *Inferno* on account of his verses intensifying the quarrel between Henry II and his sons.

**Borna** (bor'nȧ), an old town of Germany, in Saxony, 15 miles S. E. of Leipzig, with some manufactures. Pop. (1905) 9176.

**Borneo** (bor'ne-ō, corrupted from *Bruni* or *Brunei*, the name of a state on its northwest coast), one of the islands of the Malay Archipelago, and the third largest in the world. It is nearly bisected by the equator, and extends from about 7° N. to 4° S. lat., and from 109° to 119° E. lon.; greatest length 780, greatest breadth, 690 miles; area about 290,000 sq. miles. It is not yet well known, though our knowledge of it has been greatly increased in recent years. There are several chains of mountains ramifying through the interior, the culminating summit (13,698 ft.) being Kini-Balu, near the northern extremity. The rivers are very numerous, and several of them are navigable for a considerable distance by large vessels. There are a few small lakes. Borneo contains immense forests of teak and other trees, besides producing various dye-woods, camphor, rattans and other canes, gutta-percha and India rubber, honey and wax, etc. Its fauna comprise the elephant, rhinoceros, tapir, leopard, buffalo, deer, monkeys (including the orang-outang), and a great variety of birds. The mineral productions consist of gold, antimony, iron, tin, quicksilver, zinc, and coal, besides diamonds. Only portions of the land in the coastal region are well cutivated. Among cultivated products are sago, gambier, pepper, rice, tobacco, etc. Edible birds'-nests and trepang are important articles of trade. The climate is not considered unhealthy. The population is estimated at about 1,700,000, comprising Dyaks (the majority of the inhabitants), Malays, Chinese, and Bugis. The southwestern, southern, and eastern portions of the island are possessed by the Dutch, under whom are a number of semi-independent princes. On the N. W. coast is the Malay kingdom of Borneo or Bruni. Its chief town is Bruni, on the river of the same name, a place of considerable trade, and the residence of the sultan. Since 1841 there has been a state under English rule (though not under the British crown) on the W. coast of the island, namely, Sarawak (which see), founded by Sir James Brooke, while Labuan, an island off the N. W. coast, is a British colony. In 1881 an English commercial company, with a charter from the British government, acquired sovereign rights

over the northern portion of the island, extending northwards from about lat. 5° 6′ N. on the west, and lat. 4° 5′ on the east, and including some adjacent islands. British North Borneo has an area of about 31,000 sq. miles (slightly greater than Scotland), several splendid harbors, a fertile soil, and a good climate. At present the population is sparse, and a large part of the territory consists of virgin forests. The soil is believed to be well adapted for coffee, sago, tapioca, sugar, tobacco, cotton, etc. Probably there are valuable mineral deposits also, gold having been already found. The chief settlement is Sandakan, the capital, on Sandakan Bay. The government is similar to that of British colonies. The revenue is from customs and excise dues, licences, etc. Birds'-nests, rattans, gutta-percha, timber, etc., are exported, the trade being chiefly with Singapore and Hong Kong. Pop. estimated at 200,000.

**Bornholm** (born'holm), a Danish island in the Baltic Sea, 24 miles long and 16 broad; pop. 40,889. It is rather rocky, and better suited for pasture than tillage. The people are chiefly engaged in agriculture and fishing; pottery ware and clocks are made. Rönne is the chief town.

**Bornu** (bōr-nū′), a negro kingdom of the Central Sudan, on the W. side of Lake Chad, with an area of about 50,000 sq. miles, and a pop. estimated at 5,000,000. It is a pleasant and fruitful land, intersected by streams that enter Lake Chad, and presents a remarkable example of negro civilization, having a well-organized administration, a court and government, with all its dignities and offices. The people practise agriculture and also various arts and manufactures. They are Mohammedans. The *Shehu*, or sultan, has an army of 30,000 men, many armed with firearms. Kuka, former capital (pop. 60,000), near the western shore of Lake Chad, is one of the greatest markets in Central Africa, a large trade being done in horses, the breed of which is famed throughout the Sudan. Another large town, on the shore of the lake, is Ngornu. Since January, 1900, the greater part of this state has been absorbed by British Nigeria.

**Boro Budor,** the ruin of a splendid Buddhist temple in Java, situated near the Praga River, 15 m. N. W. of Jokjokarta. It is a pyramid, each side measuring 600 feet at the base; and supposed to belong to the 7th century of our era.

**Borodino** (bor-o-dē′nō), BATTLE OF (called also *battle of the Moskwa*), a sanguinary battle fought near a village of this name on the river Moskwa, 7th September, 1812, between the French under Napoleon and the Russians under Kutusoff. Each party claimed the victory. At the end of the day the Russians retreated in good order no pursuit taking place. The French force amounted to about 150,000 men; the Russian was somewhat less; 50,000 dead and dying covered the field.

**Boroglyceride** (bo-ro-glis′er-īd), a compound of boracic acid with glycerin, represented by the formula $C_3H_5BO_3$. It is a powerful antiseptic, and being nearly harmless is useful in surgery and medical practice.

**Boron** (bō′ron, symbol B, atomic weight 11), the element from which all boracic compounds are derived, is a dark-brown or green amorphous powder, which stains the skin, has no taste or odor, and is only slightly soluble in water. It also crystallizes into darkish, brilliant crystals nearly as hard as diamond, which, in the form of dust, are used for polishing. It is one of the few elements which combine directly with nitrogen.

**Borough** (bur′ō), originally a fortified town. In England, a corporate town or township; a town with a properly organized municipal government. If it sends a representative or representatives to parliament it is a *parliamentary borough;* if not, it is only a *municipal borough.* The qualifications for voters in both classes of boroughs are the same. In all boroughs a mayor is chosen annually, and a certain number of aldermen and councilors periodically, the burgesses or voters electing the councilors, and the councilors electing the mayor and aldermen. Mayor, aldermen, and councilors form the council. In the United States, an incorporated town or village in some states.

**Borovitchi** (bo-ro-vich′ē), a Russian town, gov. of Novgorod, situated on the river Msta in lat. 58° 20′ N., lon. 33° E. A market-town. Pop. 9421.

**Borovsk** (bo-rovsk′), a Russian town, gov. Kaluga, with a good trade. Pop. 8407.

**Borromean Islands** (bor-o-mā′an), four small islands in Lago Maggiore, Italy, taking their name from the family of Borromeo. Vitelliano Borromeo in 1671 caused garden soil to be spread over them, and converted them from barren rocks into gardens. Isola Bella, the most celebrated of the group, contains a handsome pal-

ace, with gardens laid out upon terraces rising above each other.

**Borromeo** (bor-o-mā'o), CARLO, COUNT, a celebrated Roman Catholic saint and cardinal, born in 1538, at Arona, on Lago Maggiore, died at Milan in 1584. In 1560 he was successively appointed by his uncle Pius IV apostolical prothonotary, cardinal, and later Archbishop of Milan. The reopening and the results of the Council of Trent, so advantageous to the papal authority, were chiefly effected by the great influence of Borromeo, which was felt during the whole sitting of the council. He improved the discipline of the clergy, founded schools, libraries, hospitals, and was indefatigable in doing good. Immediately after his death miracles were said to be wrought at his tomb, and his canonization took place in 1610.—His nephew, COUNT FEDERIGO BORROMEO, also cardinal and Archbishop of Milan, equally distinguished for the sanctity of his life and the benevolence of his character, was born at Milan in 1564; and died in 1631. He is celebrated as the founder of the Ambrosian Library (which see).

**Borrow** (bor'ō), GEORGE, an English writer, born 1803; died 1881. He had a passion for foreign tongues, stirring scenes, and feats of bodily prowess. He associated much with the gypsies, and acquired an exact knowledge of their language, manners, and customs. As agent of the British and Foreign Bible Society he traveled in France, Germany, Russia, and the East; spent five years in Spain, and published *The Gypsies in Spain* (1841), and *The Bible in Spain* (1842), the best known of his works. Other works are *Lavengro*, largely autobiographical (1850), *The Romany Rye* (1857), *Wild Wales* (1862), and *Dictionary of the Gypsy Language* (1874).

**Borrowdale** (bor'ō-dāl), a beautiful valley in the lake district of England, in Cumberland, at the head of the Derwent.

**Borrowstounness** (bor'o-stoun-nes'; popularly Bo'ness'), a town in Linlithgowshire, Scotland, with good docks, and a large trade in coal, iron, timber, etc. The wall of Antoninus ran through the parish of Borrowstounness, and traces of it, called Graham's Dyke, are still visible. Pop. 9100.

**Bor'sad,** a town of India, Bombay Presidency, about midway between Baroda and Amedabad, and distant from each about 40 miles. Pop. 12,228.

**Borsippa** (bor-sip'a), a very ancient city of Babylonia, the site of which is marked by the ruins known as Birs Nimrud.

**Bory de Saint Vincent** (bo-rē dė san van-sąn), JEAN BAPTISTE GEORGE MARIE, a French naturalist, born in 1780; died in 1846. About 1800–2 he visited the Canaries, Mauritius, and other African islands. He afterwards served for a time in the army, and conducted scientific expeditions to Greece and to Algiers. Chief works, *Annales des Sciences Physiques* (8 vols.), *Voyage dans les Quatre Principales Îles des Mers d'Afrique; Expedition Scientifique de Morée; L'Homme, Essai Zoologique sur le Genre Humain.*

**Boryslaw** (bor'i-slav), a town of Austria, in Galicia. Ozokerite and petroleum are here obtained. Pop. 10,671.

**Borysthenes** (bo-ris'the-nēz), the ancient name of the Dnieper River in Europe.

**Bosa** (bō'za), a seaport, west coast of Sardinia, in an unhealthy district, with a cathedral and a theological seminary. Pop. 6846.

**Boscan-Almogaver** (bos-kän'al-mo-ga-vär'), JUAN, a Spanish poet, born towards the close of the 15th century; died about 1540. He was the creator of the Spanish sonnet, and, in general, distinguished himself by introducing Italian forms into Spanish poetry.

**Boscawen** (bos'ka-wen), EDWARD, a British admiral, son of the first Viscount Falmouth, was born in 1711; died in 1761. He distinguished himself at Porto Bello and Cartagena, and in 1747 took part, under Anson, in the battle of Cape Finisterre. His chief exploit was a great victory in 1759 over the Toulon fleet, near the entrance of the Straits of Gibraltar.

**Boschbok** (bosh'bok), the bushbuck, a name given to several African species of antelope. See *Bushbuck.*

**Boschvark** (bosh'värk), the bush-hog or bushpig of Africa (*Potamochœrus Africānus*), one of the swine family, about 5 feet long, and with very large and strong tusks. The Kaffirs esteem its flesh as a luxury, and its tusks, arranged on a piece of string and tied round the neck, are considered great ornaments.

**Bos'cobel** (bos'kō-bel), a locality in Shropshire, remarkable historically as the hiding place of Charles II for some days after the

battle of Worcester, Sept. 3, 1651. At one time he was compelled to conceal himself among the branches of an oak in Boscobel Wood, where it is related that he could actually see the men who were in pursuit of him and hear their voices. The 'royal oak,' which now stands at Boscobel, is said to have grown from an acorn of this very tree.

**Boscovich** (bos'ko-vich), ROGER JOSEPH, an astronomer and geometrician, born at Ragusa in 1711; died at Milan in 1787. He was educated among the Jesuits, and entered into their order. He was employed by Pope Benedict XIV in various undertakings, and in 1750–53 measured a degree of the meridian in the Ecclesiastical States. He afterwards became mathematical professor in the University of Pavia, whence, in 1770, he removed to Milan, and there erected the celebrated observatory at the College of Brera.

**Bosio** (bō'se-o), FRANÇOIS JOSEPH, BARON, sculptor, born at Monaco in 1769; died at Paris in 1845. He was much employed by Napoleon and by the successive Bourbon and Orleans dynasties. His works are well known in France and Italy.

**Bosna-Serai,** or SERAJEVO (boz'na-se'-rī, se-rä-yā'vō), the capital of Bosnia, situated on the Miljacka, 570 miles W. N. W. of Constantinople. It contains a *serai* or palace, built by Mohammed II, to which the city owes its name. It was formerly surrounded with walls, but its only defense now is a citadel, built on a rocky height at a short distance east from the town. Bosna-Serai is the chief mart in the province, the center of the commercial relations between Turkey, Dalmatia, Croatia, and South Germany, and has, in consequence, a considerable trade, with various manufactures. Pop. (1910) 51,949.

**Bosnia** (boz'ni-a), a former Turkish province in the northwest of the Balkan Peninsula, adjudged by the Treaty of Berlin (1878) to be administered for an undefined future period by the Austrian government; area (including Herzegovina and Novi-bazar), 19,700 square miles (of which Bosnia proper occupies 16,000), with (1901) 1,591,036 inhabitants, mostly of Slavonian origin and speaking the Serbian language. Of these, all but about one-seventh belonged to Bosnia. They are partly Mohammedans, partly Roman and Greek Catholics. The country is level towards the north, in the south mountainous. Its chief rivers are the Save, the Vrbas, the Bosnia, Unac, and Drina. About half the area is covered with forests. Tillage is carried on in the valleys and low grounds; maize, wheat, barley, rye, buckwheat, hemp, tobacco, etc., being grown. Fruits are produced in abundance. Sheep, goats, and swine are numerous. The minerals include coal, which is worked in several places, manganese, antimony, iron, etc. Among the manufactures are iron goods, arms, leather, linens and woolens. Bosnia had been subject to Turkey from the beginning of the 15th century till 1875, when an insurrection of the inhabitants led to the Russo-Turkish war of 1877–78. It was annexed, with Herzegovina, by Austria, Oct. 6, 1908. This annexation was indirectly responsible for the great European war which began in August, 1914.

**Bosporus** (bos'po-rus), or BOSPHORUS, the strait, 19 miles long, joining the Black Sea with the Sea of Marmora, called also the Strait of Constantinople. It is defended by a series of strong forts; and by agreement of the European powers no ship of war belonging to any nation can pass the Bosporus without the permission of Turkey. Over this channel (about 3000 feet wide) Darius constructed a bridge of boats on his Scythian expedition. (See *Constantinople.*) The *Cimmerian Bosporus* was the name given by the ancients to the strait that leads from the Black Sea into the Sea of Azov. There was also anciently a kingdom of the name of Bosporus, so called from this strait, on both sides of which it was situated.

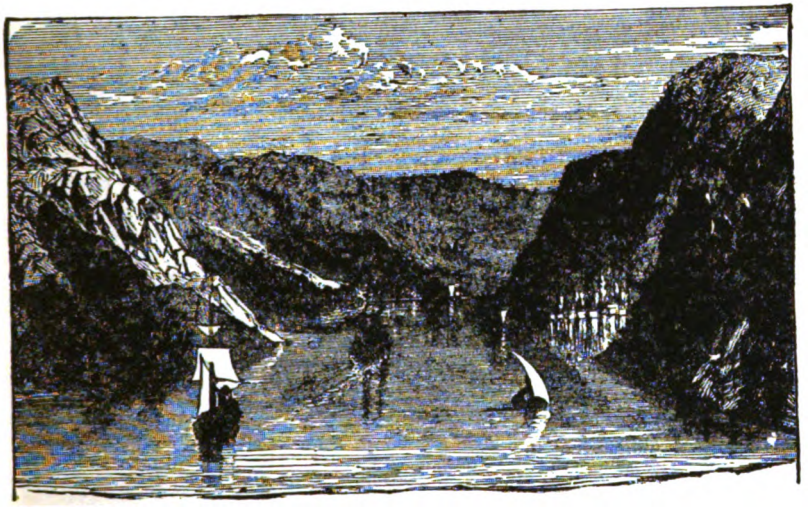
**Boss,** in architecture, an ornament placed at the intersection of the ribs or groins in vaulted or flat roofs; it is frequently richly sculptured with armorial bearings or other devices.

Boss—Wells Cathedral.

**Boss Rule,** a political term used to signify the management of federal or local government affairs for personal ends.

**Bossuet** (bos-ü-ā), JACQUES BÉNIGNE, an illustrious French preacher and theologian, was born in 1627; died in 1704. In 1652 he was ordained priest, and made a canon of Metz, where his piety, acquirements, and eloquence gained him a great reputation. In 1670 he was appointed preceptor to the Dauphin, and in 1681 he was raised to the see of Meaux. He drew up the famous propositions adopted by the assembly of French clergy, which secured

the freedom of the Gallican church against the aggressions of the pope. In his latter years he opposed quietism, and prosecuted Madame Guyon; and when his old friend Fénelon defended her he caused him to be exiled. He was unrivaled as a pulpit orator, and greatly distinguished for his strength and acumen as a controversialist. The great occupation of his life was controversy with the Protestants.



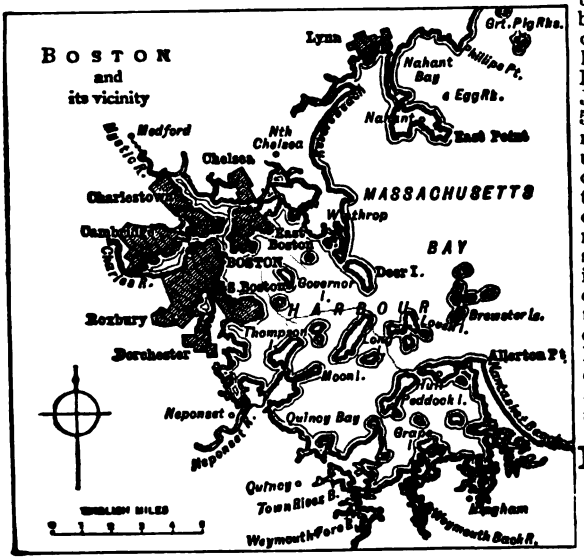
View in the Bosporus.

**Bostan'ji** (Turk., from *bostan*, a garden), a class of men in Turkey, originally the sultan's gardeners, but now also employed in several ways about his person, as mounting guard at the seraglio, rowing his barge, etc., and likewise in attending the officers of the royal household.

**Boston** (bos'tun), a borough and seaport of England, in Lincolnshire, on the Witham, about 5 miles from the sea. The name stands for Botolph's town, St. Botolph having founded a monastery here about the year 650. The trade is increasing through the improvement of the accommodation for shipping. The town contains some fine buildings, the parish church being a very large and handsome Gothic structure, with a tower nearly 300 feet high. Ropes, sails, agricultural implements, etc., are made. Pop. (1911) 16,679.

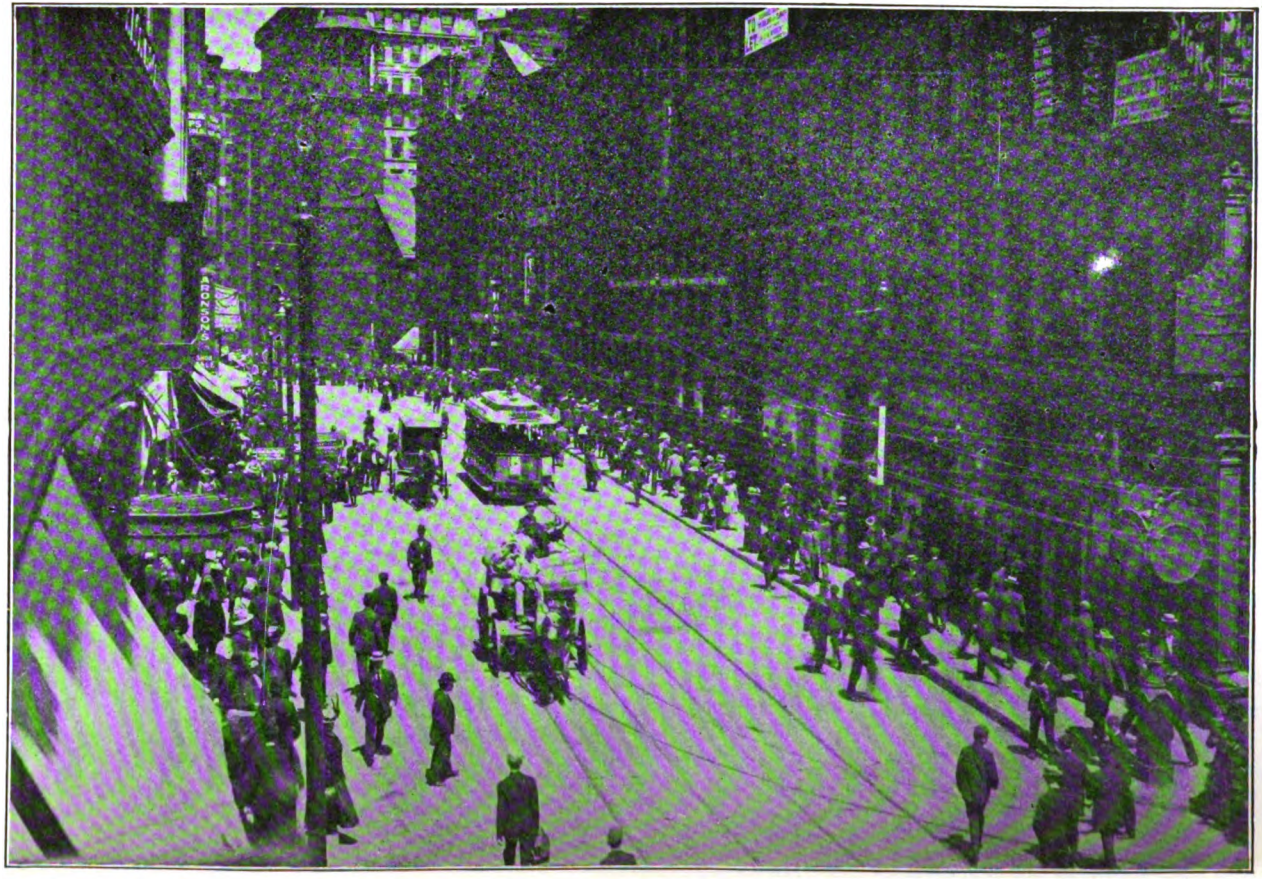
**Boston,** the capital of Massachusetts and the largest city in New England, lies on Massachusetts Bay, at the mouth of Charles River. By rail it is 234 miles N. E. of New York. It has a capacious harbor, covering 75 sq. miles, protected from storms by a great number of islands, on several of which are fortifications. The scenery is varied and picturesque, the site partly consisting of peninsulas and East Boston being on an island. The streets are mostly narrow and irregular in the older parts of the town, but in the newer parts there are many fine, spacious streets. There has been developed a splendid system of parks and connecting boulevards, containing 2308 acres of picturesque territory, with ponds, streams, drives and walks, the whole costing over $16,000,000. Among the principal buildings are the statehouse; the county courthouse; the postoffice; Faneuil Hall (from Peter Faneuil who presented it to the city in 1742), famous historically as the meeting place of the revolutionary patriots; the city hall or old statehouse, now used as public offices; the splendid granite custom house, of Grecian architecture; public halls, theaters, etc. Harvard University, situated at Cambridge, which may be regarded as a Boston suburb, was founded in 1638. It has a large and very valuable library. The medical branch of this institution is in Boston. The Boston Athenæum has two large buildings—one containing a library, and the other a picture gallery, a hall for public lectures, and other rooms for scientific purposes. Boston University, founded principally by Isaac Rich, and incorporated in 1869, consists of the

college of liberal arts, organized in 1873; a school of theology, 1871; a school of law, 1872; a school of medicine, 1873; and a graduate school of arts and sciences, organized in 1874. The institution is co-educational. The New England Conservatory of Music is one of the largest in the country. A prominent feature in Boston is the number of good libraries. Besides those connected with the universities is the Public Library, occupying a magnificent building and containing more than 1,000,000 volumes, the State Library and others. Boston carries on an extensive home and foreign trade, and is also largely engaged in the fisheries. It is an important steamship and railroad center, numerous lines converging on the city, and to relieve the congestion of street travel an elevated railway and an intricate system of subways have been constructed. Many manufactures are carried on, one of the principal being that of boots and shoes. The first American newspaper was set up here in 1704. The book trade of the city is important, and some of the periodicals are extensively circulated. Boston was founded in 1630 by English emigrants, and received its name from Boston in Lincolnshire, whence several of the settlers had come. Notwithstanding its increasing size and importance, the affairs of Boston for nearly two hundred years were administered by the townspeople assembled in 'town meeting.' In the War of Independence it played an important part. It was here that the opposition to the British measures of colonial taxation were strongest. The defiance reached its height when the Stamp Act was repealed, the Tea Act being defied by the throwing of three cargoes of tea into the harbor. Here the battle of Bunker Hill was fought, June 17, 1775. Pop. 670,585. In addition are a number of populous suburbs, some of them closely connecting with the city, there being about thirty cities and towns within a radius of ten miles of the statehouse. If these were incorporated into what is often called greater Boston, its population would considerably exceed a million. In this region is an outer park system of 9276 acres of forest, seashore and river bank, with 12 miles of boulevard.




**Boston,** THOMAS a, Scottish divine, born at Dunse in 1677; died in 1732. He was educated at Edinburgh University received license to preach in 1697, and in 1707 was appointed to the parish of Ettrick in Selkirkshire, where he remained all his life. Besides engaging hotly in the ecclesiastical controversies of his time, Boston published a volume of sermons, several theological treatises, and his two well-known works, *The Crook in the Lot* and *Human Nature in its Fourfold State.*

**Boswell** (boz'wel), JAMES, the friend and biographer of Dr. Johnson, was the eldest son of Lord Auchinleck, one of the supreme judges of Scotland. He was born at Edinburgh in 1740, and died at London in 1795. He was educated at Edinburgh and Cambridge, became a member of the Scottish bar, but never devoted himself with earnestness to his profession. In 1763 he became acquainted with Johnson—a circumstance which he himself calls the most important event of his life. He afterwards visited Voltaire at Ferney, Rousseau at Neufchâtel, and Paoli in Corsica, with whom he became intimate. In 1768, when Corsica attracted so much attention, he published his account of Corsica, with *Memoirs of Paoli.* In 1785 he settled at London, and was called to the



**WASHINGTON STREET, BOSTON**

The principal business street of Boston, named in honor of General Washington when the Continental troops occupied the city in 1776, after the withdrawal of the British forces. On this thoroughfare are located many of the largest business houses, finest theaters, and the great newspaper offices. The daily traffic is enormous.

English bar. Being on terms of the closest intimacy with Johnson, he at all times diligently noted and recorded his sayings, opinions, and actions, for future use in his contemplated biography. In 1773 he accompanied him on a tour to the Scottish Highlands and the Hebrides, and he published an account of the excursion after their return. His *Life of Samuel Johnson*, one of the best pieces of biography in the language, was published in 1791. His son ALEXANDER, born in 1775, created a baronet in 1821, killed in a duel in 1822, excelled as a writer of Scotch humorous songs, and was also a literary antiquary of no inconsiderable erudition.

**Boswellia** (boz-wel'i-a), a genus of balsamic plants belonging to the myrrh family (Amyridaceæ), several species of which furnish the frankincense of commerce, more generally known as olibanum. Indian olibanum is got from *Boswellia thurifĕra*, a large timber tree found in the mountainous parts of India.

**Bosworth** (boz'wurth), a small town in the county of Leicester, England, about 3 miles from which is Bosworth Field, where was fought, in 1485, the battle between Richard III and Henry VII. This battle, in which Richard lost his life, put a period to the Wars of the Roses. Bosworth gives name to a parl. div. of the county.

**Bosworth,** JOSEPH, an English philologist, born in Derbyshire in 1790; died in 1876. He was ordained deacon in 1814, and after filling several livings in England was British chaplain at Amsterdam and Rotterdam for twelve years. He devoted much time to researches in Anglo-Saxon and its cognate dialects, the result of his studies appearing from time to time. His chief works are his *Anglo-Saxon Grammar; Dictionary of the Anglo-Saxon Language;* and *Compendious Anglo-Saxon and English Dictionary*. In 1857 he was presented to the rectory of Water Shelford, Buckingham, and next year was appointed Rawlinson Professor of Anglo-Saxon at Oxford. In 1867 he gave $50,000 to establish a professorship of Anglo-Saxon at Cambridge.

**Bot,** BOTT. See *Botfly*.

**Botan'ic Gardens,** establishments in which plants from all climates are cultivated for the purpose of illustrating the science of botany, and also for introducing and diffusing useful or beautiful plants from all parts of the world. Until modern times their sole design was the cultivation of medicinal plants. In America the principal botanic gardens are those of New York, Philadelphia, Washington, and Cambridge. In Britain the chief botanic gardens are those of Kew (which see), Edinburgh, and Dublin. On the European continent the chief are the *Jardin des Plantes* at Paris, founded in 1634; and those of Berlin, Copenhagen, Florence, etc.

**Botany** (bot'a-ni; Gr. *botanē*, herb, plant), or PHYTOLOGY (Gr. *phyton*, plant, and *logos* discourse), is the science which treats of the vegetable kingdom.

Plants may be studied from several different points of view. The consideration of their general form and structure, and the comparison of these in the various groups from the lowest to the highest, constitutes vegetable *morphology*. *Anatomy* and *histology* treat respectively of the bulkier and the more minute internal structure of the parts, and *physiology* of their functions. *Systematic botany* considers the arrangement of plants in groups and subgroups according to the greater or less degree of resemblance between them. *Geographical botany* tells of their distribution on the earth's surface, and strives to account for the facts observed, while *palæobotany* bears the same relation to distribution in the successive geological strata which make up the earth's crust. *Economic botany* comprises the study of the products of the vegetable kingdom as regards their use to man.

The simplest plants are very minute, and can only be studied by use of the compound microscope. A little rain-water which has been standing some time when thus examined is found to contain a number of roundish green objects, each of which is an individual plant, consisting of one cell only, with an external limiting membrane or cell-wall of a substance known as *cellulose*, within which is granular, viscid *protoplasm*. The protoplasm is permeated by a green coloring matter, *chlorophyll*, and embedded in it is an oval, more solid-looking body, the nucleus. *Protococcus*, as this little plant is called, though so simple, is yet able, by virtue of the living protoplasm, to take up food from the water around it; to digest that food and form more cellulose and protoplasm so as to increase in size; and, finally, to produce new individuals, more Protococci. If we imagine Protococcus to elongate considerably and be repeatedly divided across by cell-walls, we get a row or filament of cells, a very common form among the low orders of plants: the masses of green threads seen floating in ditches in the

spring and summer consist of such a filamentous plant called *Spirogyra*. Or we may have a single flat sheet of cells, as in the delicate green seaweed *Ulva*. Increased complexity of structure is exemplified in many of the ordinary seaweeds, the stalk and more or less flattened expansions of which are several to many cells thick, the external cell-layers differing somewhat in structure from the internal. But we cannot distinguish in any of these between a stem, leaf, or root, as we can, for instance, in the more highly differentiated fern. Plants in which such a distinction cannot be drawn are called *Thallophytes*, and their whole body a *thallus*. Thallophytes can be divided into two classes: *Algæ* and *Fungi*. The former are distinguished by the presence of the green coloring matter chlorophyll, which is of vital importance in the physiology of the plant; sometimes the green color is obscured by the presence of a brown or red compound, as in the brown and red seaweed. The Fungi contain no chlorophyll, and also differ in being composed not of expansions or masses of cells like the algæ, but of numbers of delicate interlacing tubes or *hyphæ*, often forming, as in the mushroom, quite large and complicated structures. *Lichens* are an interesting class between Algæ and Fungi, inasmuch as they are built up of an alga and a fungus, which live together and are mutually dependent on each other.

Going a step higher we reach the *Mosses*, where, for the first time, we distinguish a clear differentiation of the part of the plant above ground into a stem and leaves borne upon it. The stem is attached to the soil by delicate colorless hairs—*root-hairs*. Its structure is, however, very simple, and the leaves are merely thin plates of cells. Rising still higher to the fern-like plants, including *Equisetums* (Horsetails) and *Lycopods* (Clubmosses), we notice a great advance in complexity, both of external form and internal structure. The leaves are large, often much branched, the stem stout and firm, while instead of the few simple hairs which was all the indication of a root-system to be found in the moss, there are well-developed true roots. Microscopical examination of sections of stem, leaf, or root reveals great differences in structure between various groups of cells; there is, in fact, marked *differentiation of tissues*. A tissue is a layer, row, or group of cells which have all undergone a similar development; by *differentiation of tissues* we mean that various layers, rows, or groups have developed in different ways, so that we can make out and mark by distinctive names the elements of which a stem or leaf is built up. The structure of thallophytes and mosses is very simple, but in the ferns, besides other well-marked tissues, we meet with one of so great importance in the higher plants and so constantly present that it is used as a distinctive characteristic of all the plants above the mosses. Ferns and flowering plants which contain this *vascular tissue* are known as *vascular plants*, in contrast to the thallophytes and mosses, or *cellular plants*, where it is not found. Microscopical examination of a very thin longitudinal slice of the stem, root, or leaf-stalk of a vascular plant reveals bundles of long cells running lengthwise, the walls of which are not uniformly thin, as in the cells making up the groundwork of the portion examined, but are covered with curious markings which are seen to represent local thickenings of the walls, thin places, or *pits*, being left between them. These cells, which are quite empty, are the wood cells; they are placed end to end, and when, as frequently occurs, the end-walls separating the cavities of two cells become absorbed, a wood *vessel* is formed. Near the elements of the wood, but differing greatly from them in their delicate, unchanged walls and thick, viscid contents, are the *bast-vessels*, or *sieve-tubes*, so called from the end-to-end communication between two cells being established, not by absorption of the whole wall, but by its perforation at numerous spots, forming a sieve, or cribriform, arrangement. This combination of wood and bast vessels forms the essential part of what is therefore known as vascular tissue.

*Phanerogams*, or *Flowering Plants*, represent the highest group of plants; *Seed-plants* would be a better name, as their main distinction from those already described is the production of a *seed*. The much greater variety in form and structure seen in them as compared with the ferns justifies us in regarding them as the highest group in the vegetable kingdom. They are divided into two classes. (1) Those in which the seed is developed on an open leaf, termed a carpel, and called therefore *Gymnosperms* (Gr. *gymnos*, naked, and *sperma*, seed); and (2) those in which the seed is developed in a closed chamber, formed by the folding together of one or more carpels, and called accordingly *Angiosperms* (Gr. *angeion*, vessel). To the former belong the *Conifers*—pines and firs—and *Cycads;* to the latter the rest of our trees and the enormous number of field and garden plants which are not

ferns or mosses. Angiosperms again are subdivided into *Monocotyledons*, where the embryo or young plant contained in the seed has only one primary leaf; and *Dicotyledons*, where an opposite pair of such leaves is present. Like the last group, Phanerogams are differentiated into a shoot-portion above the ground, consisting of a stem bearing leaves, and a subterranean root-portion. Both stem and root are often copiously branched, so that one individual may cover a large area both above and below ground. Stem, leaves, and roots all show great variety in form and adaptation.

The embryo, or rudimentary plant contained in the seed, consists of a very short axis or stem, bearing one (in Monocotyledons), two (in Dicotyledons), or several (in many Gymnosperms) primary leaves, the *cotyledons*, above which it terminates in a little bud or *plumule*, while below them the axis passes into the primary root or *radicle*. When the seed germinates the radicle is the first to protrude between the separating seed-coats, and growing downwards fixes itself in the soil. Then the plumule grows out accompanied or not, as the case may be, by the cotyledons, which have hitherto concealed and protected it, and by a rapid growth soon develops into a stem bearing leaves. The stem continues growing in length at its apex throughout the life of the plant; at a short distance below the apex growth in length ceases; but while in Gymnosperms and Dicotyledons it also continually increases in thickness through its whole length, Monocotyledons are distinguished by the fact that when once the stem has been formed its diameter remains unchanged. The same rule applies to the branches. The cause of this difference is found in the internal structure. In the Gymnosperm and Dicotyledon a transverse section in a very young stage has the following appearance: Starting from the outside we have, (1) a single protective layer of cells with thick external walls, the *epidermis*. (2) Inside this, and forming what is called the *cortex*, are a number of thin-walled cells arranged like bricks in a wall, or touching only at their rounded edges, and leaving intercellular spaces. Such an arrangement, where there is no dove-tailing between the cells, is called *parenchymatous*. (3) Within the cortex a ring of vascular bundles, each consisting essentially of a little group of bast-vessels towards the outside and wood-vessels on the inside, separated by a single layer of cells, the *cambium-layer*. (4) Within the ring of bundles the *pith*, of parenchyma like the cortex, and united to it by strands of similar parenchymatous cells passing between the bundles and known as *medullary rays*. As the young stem grows, however, the spaces between the bundles are filled up by development of fresh bast, cambium, and wood, so that instead of a number of separate bundles there is a *complete* vascular ring. The cambium-ring remains in active growth throughout the whole life of the plant, and by producing new bast on the outside and wood on the inside causes continual increase in thickness. The epidermis, which would of course soon give way beneath the strain of the growth inside, is replaced as a protective laver by the *bark*, development of which keeps pace with increase in diameter. Now in the young monocotyledonous stem, instead of a few bundles arranged in a ring separating pith from cortex, a great number are scattered through the whole internal parenchymatous tissue, so that we cannot distinguish any pith at all. The bundles, moreover, have no cambium-layer, so that when once formed their development is complete, and there is no increase in thickness. Stems, which may be *simple* or *branched*, are either *aërial* or *subterranean*. *Aërial* forms are: (1) *Erect*, as the trunks of trees, or the more slender stems of most herbaceous plants, or the hollow *culms* of grasses. (2) *Prostrate*, as the creeping runners of the strawberry. (3) *Climbing*, in which case they may either twine round a support, like the hop; or hold on by means of *prickles*, like the bramble; or more usually by *tendrils*, as in the vine; or, finally, by *root-fibers* given off from the stem, as in the ivy. Examples of subterranean stems are: (1) the *rhizome*, a horizontal stem sending forth aërial shoots from its upper and roots from its lower surface; (2) the *tuber*, a much-swollen fleshy stem, like the potato, the eyes of which are buds; (3) the *bulb*, a very short undeveloped stem with crowded, overlapping leaves, as the onion.

*Branches* proceed from buds which are formed in the autumn in the axils of the leaves, that is, at the point where the leaf or leaf-stalk is joined on to the stem; they remain dormant through the winter, and grow out into new shoots in the spring.

The *leaf* is borne on the stem; its tissues, epidermal, cortical, and vascular, are continuous with those of the stem; but it is distinguished by the fact that its growth is limited, it soon reaches the

normal size and stops growing. The places where leaves come off from the stem are called *nodes*. There is great variety both in the position and form of leaves. Their *position* is said to be *radical* when they are all borne close together at the base of the stem, as in the dandelion; or *cauline*, when they are borne on the upper parts; in the latter case they may have a *whorled* arrangement, where several come off at the same level in a circle round the stem, as in the herb Paris; or *opposite*, where two stand on opposite sides at each node, as in the gentians; or *alternate*, where only one comes off at any one level. The study of leaf arrangement is known as *phyllotaxy*. A leaf may be *stalked* or *sessile;* if sessile, the blade is joined directly on to the stem. The stalk is known as the *petiole*, the flattened expanded blade as the *lamina*. The leaf may be *simple* or *compound*. A simple leaf cannot be divided without tearing the lamina; while a compound leaf is made up of independent leaflets, which may come off from the same point, as in the horse-chestnut, which is the *digitate* form; or may be arranged along a continuation of the petiole, as in the ash, which is the *pinnate* form of a compound leaf. The tissue of the lamina is traversed by vascular bundles, which are continuous through the petiole with those of the stem. The great variety of their ramifications is the cause of the often very characteristic *venation* of the leaves. Leaves are said to be *deciduous* when they fall annually, as they do in the most common forest-trees; or *persistent* when they last longer, as in the firs, laurels, etc. Leaves of phanerogams are often very much modified or *metamorphosed;* thus the spines of the cactus are metamorphosed or modified leaves, as are also several forms of those curious leaf-growths known as pitchers, and many tendrils, such as those of the pea tribe. When we consider the flower we shall find that its various members are all more or less modified leaves.

In Dicotyledons and Gymnosperms the primary *root* or radicle after emerging from the seed continues to grow vigorously, often with copious lateral branching, forming an extensive root-system; but in Monocotyledons it soon perishes, and its place is taken by roots developed from the base of the stem; such roots are called *adventitious*. Adventitious roots occur also in Dicotyledons, as in creeping stems like the strawberry, which bears buds at intervals from which new shoots are formed and roots given off. The clinging roots of the ivy are also adventitious. There are many forms of roots; some are large and woody, as those of trees; others fibrous, as in grasses; or they may be greatly swollen, forming the fleshy, globose root of the turnip or the conical one of the carrot. Such fleshy developments are due to the plant storing up a quantity of reserve food-material in the first year on which to draw in the second, when it will want to expend all its energy in flowering and fruiting. The potato, which is a swollen stem, answers the same purpose. The mistletoe and other parasites give off sucker-like roots which penetrate into the tissues of their host.

As to their *reproduction*, plants may be *asexual*, that is, not requiring the co-operation of two distinct (male and female) elements to produce a new individual; or *sexual*, when two such elements are necessary, and a process of fertilization takes place in which the female cell is impregnated by one or more male cells, and the cell resulting from the fusion of the two gives rise by very extensive growth and division to a new individual. In the very lowest plants, like Protococcus, only asexual reproduction is known, but in most Thallophytes both forms occur. In the asexual method numbers of small cells called *spores* are produced which on germination give rise to a plant similar to that which bore them. In the sexual process the contents of a male organ escape and impregnate the *oösphere*, or female cell contained in the female organ. The fertilized oösphere is termed an *oöspore*, and by growth and division gives rise to a plant like that on which it was produced. In mosses and fern-like plants both sexual and asexual reproductions occur; but here the history of the life of the plant is divided into two stages, one in which it exists as an asexual individual, another in which it is sexual. In the fern, for instance, brown marks are seen on the back of some of the leaves, these are little cases containing spores; the fern as we know it is an asexual individual producing spores. The spores when set free germinate on a damp surface and produce *not* a new fern-plant, but a tiny green heart-shaped cellular expansion, called a *prothallium*, attached to the substratum by delicate root-hairs. Microscopical examination of its under surface reveals the sexual organs, a male organ producing motile male cells, which escape, pass into the female organ, and fertilize the oösphere, which then becomes the oöspore. The oöspore does not produce a new prothallium, but a fern-plant like the one with which we originally started. The cycle is thus complete.

The *flower* of a seed-plant is a shoot modified for purposes of reproduction. A buttercup, for instance, consists of a number of modified leaves borne in several whorls on the somewhat expanded top of the stalk, the *receptacle* or *thalamus*. Dissection of the flower shows (1) An outer whorl of five green leaves, very like ordinary foliage leaves; these are the *sepals*, and together make up the *calyx*. (2) An inner whorl of five yellow leaves, composing the *corolla*, each leaf being a *petal*. (3) More or less protected by the petals are a great number of *stamens*, each consisting of a slender stalk or *filament* capped by an *anther*, a little case containing the dry powdery *pollen*. The stamens are really much-modified leaves; collectively they form the *andrœcium*. (4) The rest of the receptacle right up to the apex is also covered by very much modified leaves, the *carpels*, forming the *pistil* or *gynœcium*. Each carpel consists of a basal portion, the *ovary*, in which is contained an *ovule*, and of a terminal beak-like portion, the *style*. The andrœcium and gynœcium, being the parts directly concerned in reproduction, are distinguished, as the *essential* organs of the flower, from the calyx and corolla, which are only indirectly so concerned, though of great importance in the process. The ovule contained in the ovary is equivalent to the spore produced by the fern, but instead of escaping and producing an independent sexual individual it remains in the ovary, where processes go on *within* it corresponding to those resulting in the formation of the free and independent prothallium of the fern, and finally an oösphere is produced. Pollen from the stamen of the same or another plant has meanwhile been brought on to the special receptive portion of the style known as the *stigma*, where it protrudes a long tube which reaches right down through the style to the ovule. This tube represents the male element; it comes into close contact with the oösphere and fertilizes it. The oösphere then becomes an oöspore, which by growth and division forms the *embryo* or new plant, while still included in the coats of the ovule. The ovule thus becomes the seed, which ultimately leaves the mother plant, bearing with it the embryo.

In the buttercup the members of each whorl of leaves composing the flower spring from the receptacle quite independently of each other, and of those of adjoining whorls. In many flowers, however, *cohesion* takes place between the similar members of a whorl; thus the petals frequently cohere to a greater or less distance from their base, and two great divisions of the Dicotyledons depend on this condition, namely, *Polypetalæ*, where the petals are free, as in the buttercup and poppy: and *Gamopetalæ*, with more or less coherent petals, as in the bluebell and primrose. Similarly the gynœcium, instead of being composed of free carpels as in the buttercup, the *apocarpous* condition, may be formed by the cohesion of several carpels into a one to several chambered *compound* ovary, as in the snapdragon, when it is said to be *syncarpous*. *Adhesion* also occurs between members of different whorls; thus the stamens are frequently inserted on the base of the petals, so that if we pull off a petal a stamen comes with it; and sometimes, as in orchids, the andrœcium and gynœcium are adherent. If the other floral whorls are inserted on the receptacle beneath the pistil they are said to be *hypogynous* and the pistil *superior*, as, for instance, in the poppy; if, on the other hand, as in the fuchsia, they spring from the top of the ovary, they are said to be *epigynous* and the pistil *inferior*.

An important characteristic is the *fruit*, which is the result of fertilization on the ovary. While the changes are going on by which the ovule becomes the seed the ovary also grows, often enormously, and forms the *pericarp*, which surrounds and protects the seed or seeds. The pericarp consists of an outer layer or epicarp, a middle layer or *mesocarp*, and an inner or *endocarp*. The outer usually forms the skin of the fruit; the two others may be succulent as in the berry, or the mesocarp only may be succulent and the endocarp hard and stony as in the plum. Besides the embryo the seed contains a store of food-material on which the young plant feeds during the first stages of its growth. This consists of albuminous, starchy, or fatty matter. In what are called *albuminous* seeds, as those of palms, the seed is chiefly composed of food-material in which is embedded a small embryo; the edible part of a cocoanut is the albuminous reserve material. In other seeds, like the bean, the fleshy cotyledons have already absorbed this food-material into themselves, and the seedling draws on its own cotyledons for support; these seeds are known as *exalbuminous*.

It was stated above that the ovule might be fertilized by pollen from the same flower or from another plant; experiment has shown that the latter produces better results, both as regards quality and quantity of seed, and the vigor of the seedlings. That is, *cross-fertilization* is preferable to *self-fertilization*, and the various, often extremely curious, shapes of a flower and its parts are mainly for

the purpose of ensuring the former and preventing the latter.

Many flowers contain both stamens and pistil, these are termed *bisexual* or *hermaphrodite* (☿); while others contain stamens or pistil only, and are said to be *unisexual*. When both male (♂) and female (♀) flowers occur on the same plant the species is *monœcious*, like the hazel; while it is *diœcious* if the separate sexes are borne on different individuals, as is the case in the hop.

Plants which, like the sunflower, pass through all the stages from germination to production of fruit and seed in one season, and then perish, are called *annuals;* if two years are required, as with the turnip and onion, they are *biennials;* while *perennials* last several to many years, during which they may flower and seed many times.

*Physiology.*—A plant is built up chiefly of four elements: carbon, hydrogen, oxygen, and nitrogen, with small quantities of sulphur, iron, phosphorus and other mineral matter. Substances containing these must therefore form the food. A green plant can take up its carbonaceous food in a very simple form by means of the green *chlorophyll* contained especially in its leaves. This absorbs some of the sun's rays, and by virtue of the energy represented by the light so absorbed it can obtain the carbon from the carbonic acid gas present in the atmosphere. An animal, having no chlorophyll, has to use more complex carbon-containing compounds; in fact, those which have already been worked up in the vegetable kingdom. The other items of the food are obtained from the water and mineral salts in the soil, the salts being brought into solution and absorbed with large quantities of water by the roots. The leaves are the laboratory where the food is worked up into the complex compounds which form the plant substance, and to raise the crude material from the absorbing roots to the leaves there is an upward current of liquid through the stem. This is known as the *transpiration current;* it travels in the wood-cells. A much larger quantity of water is absorbed than is required as food; this is got rid of by *transpiration*, that is, by the giving off of water-vapor from the leaves. This is evident if a plant be placed under a glass shade in the sunlight, the vapor given off becoming condensed on the glass. The complex compounds elaborated in the leaves are returned to all parts of the plant where growth, or storage of reserve material, is taking place, by means of the other constituent of the vascular bundle, the bast tissue.

Fungi and a few seed-plants contain no chlorophyll and cannot therefore get their carbonaceous food from the carbonic acid gas of the atmosphere, but have to live on decaying vegetable or animal matter, whence they are termed *saprophytes* (Greek *sapros*, rotten), like mushrooms, or on living plants or animals, when they are *parasites;* such are the fungi which cause diseases in these organisms. Plants, like animals, breathe; respiration goes on both day and night, and is represented by the absorption of oxygen from and the return of carbonic acid gas to the atmosphere. If we prevent a plant from breathing, that is keep it in an atmosphere containing no free oxygen, it will sooner or later die.

*Systematic Botany.*—In botany, as in zoology, individuals which closely resemble each other form collectively a *species*. Where existing differences are considered too minute to constitute difference of species the set of individuals in which they occur ranks as a *variety* of the species. A group of species which, though having each some distinctive peculiarity, yet on the whole resemble each other, constitutes a genus. Assemblages of genera agreeing in certain marked characters form *families* or *natural orders*. The names of the orders are generally formed on the type of *Rosaceæ*, the rose order, *Ulmaceæ*, the elm order, etc. *Classes*, such as *Monocotyledons* and *Dicotyledons*, contain a large number of natural orders. The older systems of classification were based largely on the uses of plants, for they were studied simply from a medicinal or generally economic point of view. In 1682, however, John Ray discovered the difference between Monocotyledons and Dicotyledons, and published an arrangement of plants founded on their structural forms, especially on the characters afforded by the seed; this formed the basis of the *natural* system of classification, one, that is, which brings together those genera and families which a careful comparative study of the whole structure and development shows to be most nearly related. Linnæus did not recognize Ray's great primary divisions, and his system (1735) is a purely *artificial* one, since it takes account only of a few marked characters afforded by one or two sets of organs, and does not propose to unite plants by their natural affinities. He divides Phanerogams into twenty-three classes, chiefly according to the number and character of the stamens; each class is subdivided into orders based on the number and character of the styles. Owing to the exclusive part played by the sexual organs, this arrange-

ment is known as the *sexual system*. The great value of Linnæus's work was his careful scientific revision and adjustment of all the known genera, and his introduction of the binomial system of nomenclature, in which every species has a double name, that of the genus to which it belongs coming first, then that of the species; thus *Bellis perennis L.* is the daisy, and the name shows that the species *perennis* of the genus *Bellis* is the plant in question. The *L.* which follows indicates that we mean the plant so named by *Linnæus*. The sexual system is now only of historic interest. By the sagacity of the de Jussieus the genera of Linnæus were more or less naturally grouped under Ray's primary divisions; and by the subsequent labors of de Candolle, Robert Brown, Lindley, and many others we have attained to a fairly natural system, according to the latest edition of which, the *Genera Plantarum* of Bentham and Hooker, all our great collections are arranged.

Angiosperms are grouped in fourteen classes under the two main divisions, Monocotyledons and Dicotyledons. The former comprise three classes distinguished by the relative position of the ovary and stamens. The latter comprise eleven classes based on the same set of characters, and are subdivided into Apetalæ, Monopetalæ and Polypetalæ. In the arrangement of A. P. de Candolle the Dicotyledons fall into two groups, a larger in which the flower presents both calyx and corolla; and a smaller called Monochlamydeæ. The dichlamydeous group falls into three divisions: Thalamifloræ, Calycifloræ and Corrillifloræ. This, distinguished as the French system, finds expression in the *Genera Plantarum* of Bentham and Hooker in the following subdivision:

Dicotyledons.

| | |
|---|---|
| Polypetalæ | Thalamifloræ<br>Discifloræ<br>Calycifloræ |
| Gamopetalæ | Heteromeræ<br>Bicarpellatæ<br>Inferæ |

Monochlamydeæ in eight series
Monocotyledons in seven series

Thalamifloræ contains 34 orders distributed in 6 groups or cohorts; Discifloræ, 23 orders in 4 cohorts; Calycifloræ, 27 orders in 5 cohorts. Of the Gamopetalæ, Inferæ contains 9 orders in 3 cohorts; Heteromeræ, 12 orders in 3 cohorts; Bicarpellatæ, 24 orders in 4 cohorts. The eight series of Monochlamydeæ contain 36 orders.

**Botany Bay,** a bay in New South Wales, so called by Captain Cook on account of the great number of new plants collected in its vicinity. The English penal settlement, founded in 1788, and popularly known as Botany Bay, was established on Port Jackson, some miles to the northward, near where Sydney now stands.

**Botany Bay Oak,** a name of trees of the genus *Casuarina*. See *Beef-wood*.

**Botfly,** BOTTFLY, a fly (such as *Œstrus equi*) the maggots of which are developed from the egg in the intestines of horses or under the skins of oxen; a gadfly.

**Both** (bōt), JOHN and ANDREW, two Flemish painters, born about 1610. John painted landscapes, Andrew filling in figures in so careful a manner that their pictures look like the work of one hand. Their works are in great repute. Andrew was drowned at Venice in 1650. John died at Utrecht shortly after.

**Botha** (bō'tha), LOUIS, a Boer general, born at Greytown, Natal, in 1864. He took part in the Kaffir campaign, became a prominent member of the Volksraad at Pretoria, and in the British-Boer war of 1899–1902 defeated the British at Colenso and Spion Kop and after the death of General Joubert succeeded him in command of the Boer forces. After the reorganization of the country as a British colony, he became active in political affairs, and on the formation of the Union of South Africa federation in 1910 he was made prime minister in the new government. During the European war he was commander-in-chief of the Union Forces in Southwest Africa, and in 1915 he achieved complete success, receiving the surrender of the German army in German Southwest Africa. He also supplied contingents for service in East and Central Africa.

**Bothie** (both'i; Gael, *bothag*, a cot), a house, usually of one room, for the accommodation of a number of work-people engaged in the same employment; especially, a house of this kind in parts of Scotland, in which a number of unmarried male or female farm servants or laborers are lodged.

**Bothnia** (both'ni-a), GULF OF, the northern part of the Baltic Sea, which separates Sweden from Finland. Length about 450 miles, breadth 90 to 130, depth from 20 to 50 fathoms. Its water is but slightly salt, and it freezes in the winter, so as to be passed by sledges and carriages.

**Bothriocephalus** (both-ri-ō-seph'a-lus), a genus of segmented worms, belong to the tapeworm family, one species of which (*B. latus*)

is found in the intestines of man in Russia, Norway, Sweden, Switzerland, Germany, etc., but rarely elsewhere. *B. latus* is the largest tapeworm infesting the human body. It may be 25 feet long and has 3000 or 4000 segments. The segments are 10 to 12 millimeters broad by 5 to 8 long. The head has two deep sucking furrows arranged longitudinally. Its eggs are oval, brownish, and develop in fresh water into ciliated, freely moving spheres.

**Bothwell** (both'wel), a village of Lanarkshire, Scotland, on the Clyde, 8 miles east of Glasgow. Here is Bothwell Bridge, where a decisive battle was fought in 1679 between the Scottish Covenanters and the royal forces commanded by the Duke of Monmouth, in which the former were totally routed. Near by are the fine ruins of Bothwell Castle, once a stronghold of the Douglases.

**Both'well,** JAMES HEPBURN, EARL OF, known in Scottish history by his marriage to Queen Mary, was born about 1526. One of the greatest nobles of Scotland, he lived an active and evil life, three years of it being spent in captivity or exile. After the marriage of Mary to Darnley and the murder of Rizzio, the queen's favorite, by Darnley, the next event was the murder of Darnley in which it is believed that Bothwell was deeply concerned, and that he was even supported in the act by the queen. He was charged with the crime and tried, but, appearing along with 4000 followers, was readily acquitted. He was now in high favor with the queen, and with or without her consent he seized her at Edinburgh, and carrying her a prisoner to Dunbar Castle prevailed upon her to marry him after he had divorced his own wife. But by this time the mind of the nation was roused on the subject of Bothwell's character and actions. A confederacy was formed against him, and in a short time Mary was a prisoner in Edinburgh, and Bothwell had been forced to flee to Denmark, where he died in 1576.

**Botocudos** (bo-to-cū'dos), a Brazilian race of savages who live 70–90 miles from the Atlantic, in the virgin forests of the coast range. They receive their name from the custom which they have of cutting a slit in their under lip, and in the lobes of their ears, and inserting in these, by way of ornament, pieces of wood shaped like the bung of a barrel (Portug, *botoque*). They are very skillful with the bow and arrow, and live chiefly by hunting. They number only a few thousands, and are decreasing.

**Botoshani** (bo-to-shâ'ni), a town of Roumania, in the north of Moldavia. Pop. 32,193.

**Bo-tree,** the *Ficus religiōsa*, pipal, or sacred fig-tree of India and Ceylon, venerated by the Buddhists and planted near their temples. One specimen at Anuradhapoora in Ceylon is said to have been planted before 200 B.C. It was greatly shattered by a storm in 1887.

**Botrychium** (bo-trik'i-um), a genus of ferns, of which *B. Virginicum*, the largest species, is a native of North America, New Zealand, the Himalayas, etc.

**Botrytis** (bo-trī'tis), a genus of fungi section Hyphomycetes, containing a number of plants known as moulds and mildews, some of them having the habit of growing in the tissues of living vegetables, to which they are extremely destructive. The decay of the leaves and stem in the potato disease is due to *B. infestans;* but whether this plant is the origin of the disease seems doubtful. The plants of the genus consist of a mycelium of interwoven threads.

**Botta** (bot'ta), CARLO GIUSEPPE, an eminent Italian historian, born at San Giorgio, Piedmont, about 1768; died in Paris in 1837. Studying medicine, he was in 1797 appointed surgeon to the French army in Italy and in 1803 was elected to the legislative body of France. His works comprise a *History of the War of American Independence; History of Italy from* 1789 to 1814, a very able work; A *History of the Nations of Italy from Constantine to Napoleon*, etc.

**Botta,** PAUL EMILE, a French traveler and archæologist, born about 1800. In 1833 he was appointed French consul at Alexandria. He undertook a journey to Arabia in 1837, described in his *Relation d'un Voyage dans l'Yémen*. He discovered the ruins of ancient Nineveh in 1843 while acting as consular agent for the French government at Mosul. As a result of his investigations he published two important works—one on the cuneiform writing of the Assyrians (*Mémoire de l'Écriture Cunéiforme Assyrienne*), and the other upon the monuments of Nineveh (*Monuments de Ninive*, five vols. folio, with drawings by Flandin, Paris, 1846–50), the latter of which is a work of great splendor, and makes an era in Assyrian antiquities. He earned the credit of being the first to open the rich mine of Assyrian sculptures. He died in 1870.

**Bottger,** or BÖTTIGER (beut'gėr, beu'ti-gėr), JOHANN FRIEDRICH, a

German alchemist, the inventor of the celebrated Meissen porcelain, was born in 1682. His search for the philosopher's stone or secret of making gold led him into many difficulties. At last he found refuge at the court of Saxony, where the elector erected a laboratory for him, and forced him to turn his attention to the manufacture of porcelain, resulting in the invention associated with his name. He died in 1719.

**Botticelli** (bot-te-chel'lē), SANDRO (for *Alessandro*), an Italian painter of the Florentine school, born in 1447; died in 1510. Working at first in the shop of the goldsmith Botticello, from whom he takes his name, he showed such talent that he was removed to the studio of the distinguished painter Fra Lippo Lippi. From this master he took the fire and passion of his style, and added a fine fantasy and delicacy of his own. He painted flowers, especially roses, with incomparable skill. In his later years Botticelli became an ardent disciple of Savonarola, and is said by Vasari to have neglected his painting for the study of mystical theology.

**Böttiger** (beu'ti-ger), KARL AUGUST, a German archæologist, born in 1760; died in 1835. After studying at Leipzig, he became director of the gymnasium at Weimar, and it was here that, while he enjoyed the society of Goethe, Schiller, Wieland, and other distinguished men, he began his literary career. In 1814 he was appointed chief inspector of the Museum of Antiquities in Dresden, where he continued to reside to the end of his life. Among his most important works are: *Sabina, oder Morgenscenen einer reichen Römerin* (Sabina, or Morning Scenes of a Wealthy Roman Lady); *Griechische Vasengemälde* (Paintings on Greek Vases); *Ideen zur Archæologie der Malerei* ('Thoughts on the Archæology of Painting').

**Bottle** (bot'l), a vessel of moderate or small size, and with a neck, for holding liquor. By the ancients they were made of skins or leather; they are now chiefly made of glass or earthenware. The common black bottles of the cheapest kind are formed of the most ordinary materials, sand with lime, and sometimes clay and alkaline ashes of any kind, such as kelp, barilla, or even wood ashes. This glass is strong, hard, and less subject to corrosion by acids than flint-glass.

**Bottleflower.** See *Bluebottle.*

**Bottlegourd,** a kind of gourd, genus *Lagenaria*, the dried fruits of which, when the pulp is removed, are used in warm countries for holding liquids.

**Bottlenose,** a kind of whale, of the dolphin family, genus *Hyperoödon*, 20 to 28 feet long, with a beaked snout and a dorsal fin, a native of northern seas. The caaing whale is also called bottlenose.

**Bottletree** (*Delabechea rupestris*), a tree of Northeastern Australia, order Sterculiaceæ, with a stem that bulges out into a huge, rounded mass.

Bottletree (*Delabechea rupestris*).

It abounds in a nutritious mucilaginous substance.

**Bottomry** (bot'um-ri), is a contract by which a ship is pledged by the owner or master for the money necessary for repairs to enable her to complete her voyage. The freight and even the cargo may be pledged as well as the ship. The conditions of such a contract usually are that the debt is repayable only if the ship arrives at her destination. As the lender thus runs the risk of her loss, he is entitled to a high premium or interest on the money lent. The latest bottomry bond takes precedence of all previous ones.

**Botzen** (bŏt'zen), or BOZEN, an old town in the Austrian Tyrol, well built, at the junction of roads from Switzerland, Germany, and Italy, which makes it an important forwarding station and the busiest town in the Tyrol. It has silk and cotton manufactures, tanneries, dye-works, and largely-attended annual fairs. Pop. 13,632.

**Bouches-du-Rhone** (bŏsh-dü-rōn; 'Mouths of the Rhone'), a dep. in the S. of France, in ancient Provence. Chief town, Marseilles. Area, 2026 sq. miles, of which about one-half is under cultivation. The Rhone is the principal river. The climate is generally very warm; but the dep. is liable to the *mistral*, a cold and violent N.W. wind from the Cevennes ranges.

Much of the soil is unfruitful, but the fine climate makes the cultivation of figs, olives, nuts, almonds, etc., very successful. The manufactures are principally soap, brandy, olive-oil, chemicals, vinegar, scent, leather, glass, etc. The fisheries are numerous and productive. Pop. 765,918.

**Boucicault** (bō'si-kō), Dion, dramatic author and actor, born at Dublin, Dec. 20, 1822, and educated partly at London University. He was intended for an architect, but the success of a comedy, the well-known *London Assurance*, which he wrote when only nineteen years old, determined him for a career in connection with the stage. Boucicault being a remarkably facile writer, in a few years had produced quite a lengthy list of pieces, both in comedy and melodrama, and all more or less successful. We may mention *Old Heads and Young Hearts*, *Love in a Maze*, *Used Up*, and *The Corsican Brothers*. In 1853 he went to America, where he was scarcely less popular than in England. On his return in 1860 he produced a new style of drama, dealing largely in sensation, but with more heart in it than his earlier work. The *Colleen Bawn* and *Arrah-na-Pogue* are the best examples. Indeed, Mr. Boucicault's best work was seen in these pictures of Irish life and manners. His dramatic pieces are said to number upwards of 150. He died Sept. 18, 1890.

**Boudoir** (bö'dwär), a small room, elegantly fitted up, destined for retirement (from Fr. *bouder*. to pout, to be sulky). The boudoir is the peculiar property of the lady, where only her most intimate friends are admitted.

**Boufflers,** or Bouflers (bö-flär), Louis François, Duc de, Marshal of France, one of the most celebrated generals of his age, was born in 1644; died in 1711. He learned the art of war under such renowned generals as Condé, Turenne, and Catinat. His defense of Namur against King William of England and of Lille against Prince Eugene are famous, and he conducted the retreat of the French at Malplaquet with such admirable skill as quite to cover the appearance of defeat.

**Bougainville** (bö-gan-vēl), Louis Antoine de, a famous French navigator, born at Paris in 1729. At first a lawyer, he afterwards entered the army and fought bravely in Canada under the Marquis of Montcalm, and it was principally due to his exertions, in 1758, that a body of 5000 French withstood successfully a British army of 16,000 men at Ticonderoga. After the battle of September 13, 1759, in which Montcalm was killed and the fate of the colony decided, Bougainville returned to France, and served with distinction in the campaign of 1761 in Germany. After the peace he entered the navy, and became a distinguished naval officer. In 1763 he undertook the command of a colonizing expedition to the Falkland Islands, but as the Spaniards had a prior claim the project was abandoned. Bougainville then made a voyage round the world, which enriched geography with a number of new discoveries. In the American war of independence he distinguished himself at sea, but withdrew from the service after the Revolution, and died in 1811.

**Bougainville Island** (see above), an island in the Pacific Ocean belonging to the Solomon group (area, 4000 sq. miles), and under German protection. It is separated from Choiseul Island by *Bougainville Strait*.

**Boughton** (bow'ton), George H., an English painter, born, 1830; died, 1905. He resided for a time in Albany, N. Y., but in 1859 returned to England. Among his best paintings are *Lake of the Dismal Swamp*, *The Scarlet Letter*, *The Return of the Mayflower*, *Coming through the Rye*, *Passing into the Shade*.

**Bougies** (bö-zhēz; the French word for tapers), in surgery applied to certain smooth cylindrical rods which are introduced into the canals of the human body in order to widen them, or more rarely to apply medicaments to a particular part in the interior of the body. They are distinguished from catheters by being quite solid. They are made sometimes of linen dipped in wax and then rolled up, sometimes of a kind of plaster and linen, also of caoutchouc or gutta-percha, or of metal, such as lead, silver, or German silver.

**Bouguer** (bö-gā), Pierre, a French mathematician and astronomer, born in 1698. He was associated with Godin and La Condamine in an expedition to the South American equatorial regions to measure the length of a degree of the meridian. The main burden of the task fell upon Bouguer, who performed it with great ability, and published the results in his *Théorie de la Figure de la Terre*. He also invented the heliometer, and his researches upon light laid the foundation of photometry. He died in 1758.

**Bouguereau** (bög-rō), Adolphe Guillaume, born at La Rochelle, France, in 1825; died at Paris in 1905. On leaving college he engaged in business in Bordeaux, where he at the same time studied art under M [illegible]

and at the end of the first year won first prize. Then he became a pupil of M. Picot in Paris, and in 1854 won the Roman prize. He had already become prominent in the École des Beaux-Arts, and soon advanced to high rank in his profession, eventually becoming President of the Society of Artists, and one of the most popular artists of the century.

**Bouillon,** GODFREY. See *Godfrey of Bouillon.*

**Boulanger** (bö-lȧn-zhā), GEORGES ERNEST JEAN MARIE, a French general, born at Rennes in 1837. He served ably in the Franco-German war and in 1886 was made minister of war. His free criticism of the authorities and general insubordination caused his arrest and dismissal from the army, but his following was strong and he was elected deputy. 'Boulangism' grew so formidable that the authorities prosecuted him in 1889. He fled from the country, was condemned in his absence and committed suicide in Brussels in 1891.

**Boulder** (bōl'dėr), a rounded water-worn stone of some size; in geology applied to ice-worn and partially smoothed blocks of large size lying on the surface of the soil, or embedded in clays and gravels, generally differing in composition from the rocks in their vicinity, a fact which proves that they must have been transported from a distance, probably by ice. When lying on the surface they are known as *erratic blocks.* The *boulder-clay* in which these blocks are found belongs to the post-tertiary or quaternary period. It occurs in many localities, consists of a compact clay, often with thin beds of gravel and sand interspersed, and is believed to have been deposited from icebergs and glaciers in the last glacial period.

**Boulder,** a city, county seat of Boulder Co., Colorado, 29 miles from Denver. Tungsten, gold, silver, lead, copper, coal, iron, oil, gas, fire clays and kaolin abound, and there is a large milling and elevator company. Here is located the State University. Pop. 10,000.

**Boulevard** (böl-vär, bö'le-vard), a word formerly applied to the ramparts of a fortified town, but when these were leveled, and the whole planted with trees and laid out as promenades, the name boulevard was still retained. Modern usage applies it also to many streets which are broad and planted with trees, although they were not originally ramparts. The most famous boulevards are those of Paris. See *Paris.*

**Boulogne** (bö-lon-yė or bö-lōn), or BOULOGNE-SUR-MER, a fortified seaport of France, dep. Pas de Calais, at the mouth of the Liane. It consists of the upper and lower town. The former is surrounded with lofty walls, and has well-planted ramparts; the latter, which is the business part of the town, has straight and well-built streets, and is semi-English in character and language. In the castle, which dates from 1231, Louis Napoleon was imprisoned in 1840. Boulogne has manufactories of soap, earthenware, linen and woolen cloths; wines, coal, corn, butter, fish, linen and woolen stuffs, etc., are the articles of export. Steamboats run daily between this place and England, crossing over in two or three hours. Napoleon, after deepening and fortifying the harbor, encamped 180,000 men here with the intention of invading Britain at a favorable moment; but, upon the breaking out of hostilities with Austria, 1805, they were called to other places. Pop. 53,128, about a tenth being English.

**Boulogne,** BOIS DE. See *Bois de Boulogne.*

**Boulogne-sur-Seine,** a town of France, dep. Seine, southwest of Paris, of which it is a suburb. It is from this place that the celebrated Bois de Boulogne gets its name. Pop. 57,027.

**Boulton** (bōl'ton), MATTHEW, a celebrated mechanician, was born at Birmingham in 1728; died there in 1809. He engaged in business as a manufacturer of hardware, and invented and brought to great perfection inlaid steel buckles, buttons, watch-chains, etc. In 1762 he added to his premises by the purchase of the Soho, a barren heath near Birmingham, where he established an extensive manufactory and school of the mechanical arts. The introduction of the steam-engine at Soho led to a connection between Boulton and James Watt, who became partners in trade in 1769.

**Bounty** (boun'ti), in political economy, is a reward or premium granted for the encouragement of a particular species of trade or production, the idea being that the development of such trade or production will be of national benefit. In Britain the idea of the inefficacy of bounties to sustain or develop commerce or manufactures is in general pretty well established, the usual argument being that it is nothing less than taxing the general community in order to encourage individuals to engage in businesses which, in the existing state of markets and competition, it would be better to let alone. Hence the British government has long given up the system of bounties, except in such peculiar cases as the subsidies granted for carrying the oceanic mails.—The same name is given to a premium

offered by government to induce men to enlist in the public service, especially to the sum of money given in some states to recruits in the army and navy.

**Bourbaki** (bŏr-ba-kē), a French general of Greek descent, born at Pau in 1816. He entered the zouave corps as sublieutenant in 1836, served with great distinction in Africa and in the Crimea, became a brigadier in 1854 and a division general in 1857. He com- Franco-German war, and after his troops manded the army of the East in the were driven over the Swiss frontier and interned there, he shot himself. He recovered from the wound, however, and was made soon after military governor of Lyons, and later on took command of the 14th corps, resigning in 1879. He died in 1897.

**Bouquetin** (bŏ'ke-tin). See *Ibex*.

**Bourbon** (bŏr-bon), an ancient French family which has given three dynasties to Europe, the Bourbons of France, Spain, and Naples. The first of the line known in history is Adhemar, who, at the beginning of the 10th century, was lord of the Bourbonnais (now the dep. of Allier). The power and possessions of the family increased steadily through a long series of Archambaulds of Bourbon till in 1272 Beatrix, daughter of Agnes of Bourbon and John of Burgundy, married Robert, sixth son of Louis IX of France, and thus connected the Bourbons with the royal line of the Capets. Their son Louis had the barony converted into a dukedom and became the first Duc de Bourbon. Two branches took their origin from the two sons of this Louis, Duke of Bourbon, who died in 1341. The elder line was that of the Dukes of Bourbon, which became extinct at the death of the Constable of Bourbon in 1527, in the assault of the city of Rome. The younger was that of the Counts of La Marche, afterwards Counts and Dukes of Vendôme. From these descended Anthony of Bourbon, Duke of Vendôme, who by marriage acquired the kingdom of Navarre, and whose son Henry of Navarre became Henry IV of France. Anthony's younger brother, Louis, Prince of Condé, was the founder of the line of Condé. There were, therefore, two chief branches of the Bourbons—the royal and that of Condé. The royal branch was divided by the two sons of Louis VIII, the chief of whom, Louis XIV, continued the chief branch, whilst Philip, the younger son, founded the house of Orleans as the first duke of that name. The kings of the *elder French royal line* of the house of Bourbon were as follows: Henry IV, Louis XIII, XIV, XV, XVI, XVII, XVIII, and Charles X. The last sovereigns of this line, Louis XVI, Louis XVIII, and Charles X (Louis XVII, son of Louis XVI never obtained the crown), were brothers, all of them being grandsons of Louis XV. Louis XVIII had no children, but Charles X had two sons, viz., Louis Antoine de Bourbon, Duke of Angoulême, who was dauphin till the revolution of 1830, and died without issue in 1844, and Charles Ferdinand, Duke of Berry, who died, 14th Feb., 1820, of a wound given him by a political fanatic. The Duke of Berry had two children: (1) Louise Marie Thérèse, called Mademoiselle d'Artois; and (2) Henri Charles Ferdinand Marie Dieudonné, born in 1820, and at first called Duke of Bordeaux, but afterwards Count de Chambord, who was looked upon by his party until his death (in 1883) as the legitimate heir to the crown of France.

The branch of the Bourbons known as the *house of Orleans* was raised to the throne of France by the revolution of 1830, and deprived of it by that of 1848. It derives its origin from Duke Philip I of Orleans (died 1701), second son of Louis XIII, and only brother of Louis XIV. A regular succession of princes leads us to the notorious Égalité Orleans, who in 1793 died on the scaffold, and whose son Louis Philippe was king of France from 1830 to the revolution of 1848.

The *Spanish Bourbon dynasty* originated when in 1700 Louis XIV placed his grandson Philip, Duke of Anjou, on the Spanish throne, who became Philip V of Spain. From him descends the present occupant of the Spanish throne, Alphonso XIII, born in 1886.

The royal line of *Naples*, or the Two Sicilies, took its rise when in 1735 Don Carlos, the younger son of Philip V of Spain, obtained the crown of Sicily and Naples (then attached to the Spanish monarchy), and reigned as Charles III. In 1759, however, he succeeded his brother Ferdinand VI on the Spanish throne, when he transferred the Two Sicilies to his third son Fernando (Ferdinand IV), on the express condition that this crown should not be again united with Spain. Ferdinand IV had to leave Naples in 1806; but after the fall of Napoleon he again became king of both Sicilies under the title of Ferdinand I, and the succession remained to his descendants till 1860, when Naples was incorporated into the new kingdom of Italy.

**Bourbon,** CHARLES, DUKE OF, or CONSTABLE OF BOURBON, son of Gilbert, Count of Montpensier, was born

in 1489, and by his marriage with the heiress of the elder Bourbon line acquired immense estates. He received from Francis I, in the twenty-sixth year of his age, the title of Constable, and in the war in Italy rendered important services by the victory of Marignano and the capture of Milan. After occupying for years the position of the most powerful and highly honored subject in the realm he suddenly fell into disgrace, from what cause is not clearly known. But it is certain that the intrigues of the court party, headed by the king's mother and the Duke of Alençon, were threatening to deprive him both of honors and estates. The Constable, embittered by this return for his services, entered into treasonable negotiations with the Emperor Charles V and the King of England (Henry VIII), and eventually fled from France to put his sword at the service of the former. He was received with honor by Charles, who knew his ability, and being made general of a division of the imperial army, contributed greatly to the overwhelming defeat of Francis at Pavia. But Bourbon found that Charles V. was readier to make promises to him than to fulfil them, and he returned disappointed and desperate to the command of his army in Italy, an army nominally belonging to the emperor, but composed mostly of mercenaries, adventurers, and desperadoes from all the countries of Europe. Supplies falling short, and the emperor refusing to grant him more, the Constable formed the daring resolve of leading his soldiers to Rome and paying them with the plunder of the Eternal City. On May 6, 1527, his troops took Rome by storm, and the sacking and plundering continued for months. But Bourbon himself was shot at the head of his soldiers in scaling the walls.

**Bourbon,** ISLE OF. See *Réunion.*

**Bourbon,** a name often given to whisky in the United States.

**Bourbonnais** (bör-bon-ā), a former province of France, with the title first of a county, and afterwards of a duchy, lying between Nivernais, Berry, and Burgundy, and now forming the department of the Allier. See *Bourbon.*

**Bourbon-Vendée** (bör-bōn-vän-dā), NAPOLÉON - VENDÉE, a French town, now LA ROCHE-SUR-YON.

**Bourchier** (bör'chi-er), JOHN, LORD BERNERS. See *Berners.*

**Bourdaloue** (bör-dä-lö), LOUIS, one of the great church orators of France, was born at Bourges in 1632, and entered the order of the Jesuits, becoming teacher of rhetoric, philosophy, and morals in the Jesuit college of his native place. In 1669 he entered the pulpit, and he preached for a series of years at the court of Louis XIV with great success. The lofty and dignified eloquence with which he assailed the vices of contemporary society brought him fame even at a time when Paris was ablaze with the feasts of Versailles, the glory of Turenne's victories, and the masterpieces of Corneille and Racine. After the repeal of the Edict of Nantes (1686) he was sent to Languedoc in order to convert the Protestants, a task in which he was not unsuccessful. His sermons are amongst the classics of France. He died in 1704.

**Bourdon** (bör'don), a bass stop in an organ or harmonium having a droning quality of tone.

**Bourg** (börg), or BOURG-EN-BRESSE, a town of Eastern France, capital of the dep. of Ain, well built, with a handsome parish church, public library, museum, monuments to Bichat, Joubert, and Edgar Quinet, and near the town the beautiful Gothic church of Brou, built in the early 16th century; some manufactures and a considerable trade. Pop. (1906) 13,916.

**Bourgelat** (börzh-lä), CLAUDE, creator of the art of veterinary surgery in France, born in 1712; died in 1779. He established the first veterinary school in his native town in 1762, and his works on the art furnished a complete course of veterinary instruction.

**Bourgeois** (bur-jō' or bur-jois), a size of printing type larger than brevier and smaller than long primer, used in books and newspapers.

**Bourgeoisie** (börzh-wâ-zē), a name applied to a certain class of population in France, in contradistinction to the nobility and clergy as well as to the working classes. It thus includes all those who do not belong to the nobility or clergy and yet occupy an independent position, from financiers and heads of great mercantile establishments at the one end to master tradesmen at the other. The term was used by the leaders of the Bolsheviki (*q. v.*) in Russia to apply to all who were not of the laboring class. In America it is usually applied to the middle classes.

**Bourges** (börzh), an ancient city of France, capital of the dep. of Cher, situated at the confluence of the Auron and Yèvre, 124 miles S. of Paris, formerly surrounded with ramparts, now laid out as promenades. It has crooked and gloomy streets, and houses built in the old style. The most noteworthy

building is the cathedral (an archbishop's) of the 13th century, and one of the finest examples of Gothic in France. Bourges is a military center and has an arsenal, cannon-foundry, etc., manufactures of cloth, leather, etc. Pop. 45,375.

**Bourget** (bōr-zhā), PAUL, a French novelist, born at Amiens in 1852. His literary career began with several volumes of striking verse and two volumes of *Essais*. His first novel, *L'Irréparable*, appeared in 1884. Many others followed, also *Sensations d'Italie*, and *Outre Mer*, a work of travel to the United States. He was elected to the French Academy in 1894.

**Bourmont** (bōr-mōn), LOUIS AUGUSTE VICTOR DE GHAISNE, COMTE DE, Marshal of France, born in 1773; died in 1846. Entering the republican army, he distinguished himself under Napoleon, who made him a general of division. After the restoration he readily took service with the new dynasty, and in 1830 commanded the troops which conquered Algiers, a success which gained for him the marshal's baton. After the revolution of 1830 he followed the banished Charles X into exile, but later retired to his estate in Anjou, where he died.

**Bourne** (bōrn), VINCENT, an English scholar, born in 1695; died in 1747. In 1721 after graduating as M.A. at Cambridge, he became a master in Westminster School, where he remained, so far as is known, to the end of his life. He is one of the few who have attained a kind of fame for writing Latin verse with a felicity and grace which might seem to rival those of the Roman poets themselves. His poems in Latin, which include original compositions and versions of English songs, epitaphs, etc., were first published in 1734. Cowper and Lamb translated various pieces of his.

**Bournemouth** (bōrn'muth), a watering-place in Hampshire, having one of the best beaches in England. It has a fine climate and beautiful scenery, and has greatly increased in population in recent years. Pop. (1911) 78,677.

**Bournouse.** See *Burnoose.*

**Bourrienne** (bō-rē-ān), FAUVELET DE, a French diplomatist, was born in 1769, and educated along with Bonaparte at the school of Brienne, where a close intimacy sprang up between them. Bourrienne went to Germany to study law and languages, but returning to Paris in 1792 renewed his friendship with Napoleon, from whom he obtained various appointments, one of them that of minister plenipotentiary at Hamburg. His character suffered from his being involved in several dishonorable monetary transactions, yet he continued to fill high state offices and in 1814 was made prefect of police. On the abdication of Napoleon he paid his court to Louis XVIII, and was nominated a minister of state. The revolution of July, 1830, and the loss of his wealth affected him so much that he lost his reason, and died in a lunatic asylum in 1834. His *Mémoires sur Napoléon, le Directoire, le Consulat, l'Empire et la Restauration* are valuable.

**Boussa** (bō'sa), a kingdom of Gando, W. Sudan, on the Niger.

**Boussingault** (bō-saṇ-gō), JEAN BAPTISTE JOSEPH DIEUDONNÉ, a French chemist, born at Paris in 1802; died in 1887. He went to South America in the employment of a mining company, and made extensive travels and valuable scientific researches there. Returning to France he became professor of chemistry at Lyons in 1839, was made a member of the Institute, and then made Paris his chief residence. His works deal chiefly with agricultural chemistry, and include *Economie Rurale* (translated into English and German); *Mémoires de Chimie agricole et de Physiologie; Agronomie, Chimie agricole, et Physiologie*, etc.

**Bouterwek** (bō'ter-vek), a German author, born in 1706; died in 1828. He became a deep student of philosophy and literary history, his *History of Modern Poetry and Eloquence* (1801–19) being a work of high value, the part which treats of Spanish poetry and eloquence being especially esteemed.

**Bouts Rimés** (bō rē-mā; French, 'rhymed ends'), words or syllables given as the ends of the verses, the other parts of the lines to be supplied by the ingenuity of the poet. In the 17th century the composition of *bouts rimés* was a fashionable amusement.

**Bout'well,** GEORGE SEWALL, a statesman, born in Brookline, Massachusetts, in 1818. Soon after being admitted to the bar (1836) he entered politics as an Anti-Slavery Democrat. He was governor of Massachusetts 1851–3, and afterwards one of the organizers of the Republican party in that State. In 1863–9 he was in Congress, and was one of those conducting the impeachment of President Johnson. During Grant's first term he was Secretary of the Treasury, and subsequently (1873–7) a member of the Senate. He died Feb. 28, 1905.

**Bovidæ** (bov'i-dē), the ox family of animals, including the common ox, the bison, buffalo, yak, zebu, etc. They are hollow-horned, ruminant animals, generally of large size, with broad, hairless muzzles and stout limbs, and most of them have been domesticated.

**Bovino** (bō-vē'nō), a fortified town of South Italy, province of Foggia or Capitanata, 20 miles S. S. W. Foggia, the seat of a bishopric, suffragan to Benevento. Pop. 7613.

**Bow** (bō), the name of one of the most ancient and universal weapons of offense. Formerly made solely of wood, it is now of steel, wood, horn, or other elastic substance. The figure of the bow is nearly the same in all countries. The ancient Grecian bow was somewhat in the form of the letter E: in drawing it, the hand was brought back to the right breast, and not to the ear. The Scythian bow was nearly semicircular. The long-bow in medieval wars was the favorite national weapon in England. The battles of Crécy (1346), Poictiers (1356), and Agincourt (1415) were won by this weapon. It was made of yew, ash, etc., of the height of the archer, or about 6 feet long, the arrow being usually half the length of the bow. The arbalist, or crossbow, was a popular weapon with the Italians, and was introduced into England in the 13th century, but never was so popular as the long-bow. In England the strictest regulations were made to encourage and facilitate the use of the bow. Merchants were obliged to import a certain proportion of bow-staves with every cargo; town-councils had to provide public shooting butts near the town. Of the power of the bow, and the distance to which it will carry, some remarkable anecdotes are related. Thus Stuart (*Athenian Antiquities*, i) mentions a random shot of a Turk, which he found to be 584 yards. In the journal of King Edward VI it is mentioned that 100 archers of the king's guard shot at a 1-inch board, and that some of the arrows passed through this and into another board behind it, although the wood was extremely solid and firm. See *Archery*.

**Bow,** in music, is the name of that well-known implement by means of which the tone is produced from violins and other instruments of that kind. It is made of a thin staff of elastic wood, tapering slightly till it reaches the lower end, to which the hairs (about 80 or 100 horse-hairs) are fastened, and with which the bow is strung. At the upper end is an ornamental piece of wood or ivory called the *nut*, and fastened with a screw, which serves to regulate the tension of the hairs.

**Bow Bells,** the peal of bells belonging to the church of St. Mary-le-Bow, Cheapside, London, and celebrated for centuries. One who is born 'within the sound of Bow Bells' is considered a genuine Cockney.

**Bowdich** (bou'dich), THOMAS EDWARD, an African traveler, born in 1790. In 1816 he led an embassy to the King of Ashantee, and afterwards published an account of his mission (1819). Having undertaken a second African expedition, he arrived at the river Gambia, where disease put an end to his life in 1824.

**Bowditch** (bou'ditch), NATHANIEL, an eminent mathematician, born at Salem, Massachusetts, in 1773. After serving as ship-chandler and as an officer on a merchant ship, he attracted attention in 1802 by his *The Practical Navigator*. He was afterwards connected with insurance companies, and (1829–38) performed the great work of translating Laplace's *Mécanique Céleste*, with a copious commentary which added greatly to its value. He died in 1838.

**Bowdoin** (bō'd'n), JAMES, born in 1727, at Boston, Massachusetts; died in 1790. He distinguished himself as an opponent of the policy of Britain; in 1785 was appointed governor of Massachusetts, and he was a member of the Constitutional Convention of 1787. He was a friend and correspondent of Franklin.—*Bowdoin College*, Brunswick, Maine, was named after him. It is a flourishing institution, which has had among its students Longfellow and Hawthorne.

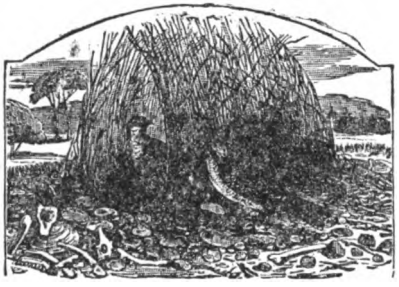
**Bowen** (bō'en), FRANCIS, author, born at Charlestown, Massachusetts, in 1811. In 1853 he became professor of natural religion, moral philosophy and civil polity at Harvard University. He published *Lowell Lectures in the Application of Metaphysical and Ethical Science to the Evidences of Religion*, and *Principles of Political Economy applied to the Conditions of the American People*. He died in 1890.

**Bower** (bou'er), an anchor; so named from being carried at the *bow* of a ship. See *Anchor*.

**Bower,** ARCHIBALD, a Scottish writer, born in 1686, of Catholic parents. He was employed by the booksellers in conducting the *Historia Literaria*, a monthly review of books, and in writing a part of the *Universal History*, in sixty vols. 8vo. He also published a *History of the Popes* characterized by the utmost

zeal against popery. He died a Protestant in 1766.

**Bower-bird,** a name given to certain Australian birds of the starling family from a remarkable habit they have of building bowers to serve as places of resort. The bowers are constructed on the ground, and usually under overhanging branches in the most retired parts of the forest. They are decorated with variegated feathers, shells, small pebbles, bones, etc. At each end there is an entrance left open. These bowers do not serve as nests at all, but seem to be places of amusement and resort, especially during the breeding season.—*The Satin Bower-bird* (*Ptilonorhynchus holosericĕus*), is so called from its beautiful glossy plumage, which is of a black color. Another common species is the *Spotted Bower-bird*



Bower-bird (*Chlamydēra maculāta*) and its Run.

(*Chlamydēra maculāta*), which is about 11 inches long, or rather smaller than the first mentioned, and less gay in color, but is the most lavish of all in decorating its bowers.

**Bowie-knife,** a long kind of knife like a dagger, but with only one edge, named after Colonel James Bowie, and formerly much used in America by hunters and others.

**Bow Instruments,** are all the instruments strung with catgut from which the tones are produced by means of the bow. The most usual are the double-bass (*violono* or *contrabasso*), the small bass, or *violoncello*, the tenor (*viola di braccio*), and the violin proper (*violino*). In reference to their construction the several parts are alike; the difference is in the size. See *Violin*.

**Bowles** (bōlz), William Lisle, an English poet, was born in 1762 at King's Sutton, Northamptonshire, where his father was vicar; died in 1850. He was educated at Winchester and Oxford, where he gained high honors. In 1789 he composed a series of sonnets, by which the young minds of Coleridge and Wordsworth, then seeking for new and more natural chords in poetry, were powerfully affected. Having entered holy orders Bowles was, in 1805, presented to the living of Bremhill, in Wiltshire, where he continued to reside for the rest of his life. Besides the sonnets he published several poems (*The Spirit of Discovery, The Missionary of the Andes. St. John in Patmos*, etc.), which are characterized by graceful diction and tender sentiment rather than by any higher qualities.

**Bowline** (bō'lĭn), in ships, a rope leading forward, which is fastened by bridles to loops in the ropes on the perpendicular edge of the square sails.

**Bowling Green,** capital of Warren Co., Kentucky, 71 miles N. by E. of Nashville at the head of navigation on Barren River, is an important shipping place. It has manufactures of tobacco, carriages, etc., and a large horse market. Pop. 9173.

**Bowling Green,** a city, capital of Wood Co., Ohio, 20 miles S. W. of Toledo. Oil is found largely near by, and it has various manufactures, including cut glass works, torpedo works, etc. Pop. 5222.

**Bowls** (bōls), Bowling, an ancient British game, still extremely popular. It is played on a smooth, level piece of greensward, generally about 40 yards long, and surrounded by a trench or ditch about 6 inches in depth. A small white ball called the *jack* is placed at one end of the green, and the object of the players, who range themselves in sides at the other, is so to roll their bowls that they may lie as near as possible to the jack. Each bowl is *biased* by being made slightly conical so as to give it a curvilinear direction; and in making the proper allowance for this bias, and so regulating the cast of the ball, consist the skill and attraction of the game. The side which owns the greatest number of bowls next the jack, gains the victory. See *Ten Pins*.

**Bowman** (bō'man), Sir William, an English anatomist and surgeon, born in 1816; died in 1892. He was surgeon to King's College Hospital, London, and Professor of Physiology and Anatomy in King's College, and especially distinguished as an ophthalmic surgeon. He gained the Royal Society's royal medal for physiology in 1842. He was collaborator with Todd in the great work on the *Physiological Anatomy and Physiology of Man*, and wrote on oph-

thalmology. He was created a baronet in 1884.

**Bowring** (bou'ring), SIR JOHN, an English statesman and linguist, born at Exeter in 1792, the son of a cloth manufacturer. While still very young he was taken by his father into his own business, and employed by him to travel in different parts of Europe. Having an extraordinary linguistic faculty he made use of his residence in foreign countries to acquire the different languages, and his first publications consisted of translations of poems and songs from the Russian, Servian, Polish, Magyar, Swedish, Frisian, Esthonian, Spanish, and other languages. He is well known also by his translations from Goethe, Schiller, and Heine. He was an ardent Radical and supporter of Jeremy Bentham, and edited the *Westminster Review* from 1825 to 1830. He held various government appointments, one of them being the governorship of Hong Kong, and the last being in 1861, when he was sent to Italy to report on British commercial relations with the new kingdom. He died Nov. 23, 1872.

**Bowsprit** (bō'sprit), the large boom or spar which projects over the stem of a vessel, having the foremast and foretopmast stays and staysails attached to it, while extending beyond it is the jib-boom.

**Bowstring-hemp,** the fiber of the leaves of an East Indian plant, or the plant itself, *Sanseviera zeylanica*, order Liliaceæ, so named from being made by the natives into bowstrings. The fiber is fine and silky, but very strong.

**Bow-window,** a window constructed so as to project from a wall, properly one that forms a segment of a circle. See *Bay-window*.

**Bowyer** (bō'yėr), WILLIAM, an English printer and classical scholar, born 1699, a native of London, where his father, also a printer, carried on business. In 1729 he became printer of the votes of the House of Commons, and subsequently printer to the Society of Antiquarians and to the Royal Society. In 1767 he was nominated printer of the journals of the House of Lords and the rolls of the House of Commons. He died in 1777.

**Box.** See *Boxtree*.

**Box-elder,** the ash-leaved maple (*Negundo aceroides*), a small but beautiful tree of the United States, from which sugar is made. The wood is light and soft.

**Boxer Rebellion** was an uprising of the Chinese that grew out of the bitter anti-foreign sentiment aroused by the unseemly scramble of some of the European powers for the occupation of large areas of Chinese territory, euphemistically called 'spheres of influence,' which followed the war between China and Japan in 1894-95. Russia had seized Port Arthur and the harbor of Taheneran; Germany had 'leased' Kiaochau and acquired vast concessions in Shang Tung province; France desired certain privileges in Chinese territory adjacent to her possessions of Tonguin; and Great Britain had secured a lease of Wei-Hai-Wei, on the south shore of Pechili, commanding the entrance to the gulf and the waterway to Peking. Through the close interest of the United States in the affairs of the Far East, owing to the possession of the Philippine Islands, Secretary Hay procured in 1899, an agreement by the European powers concerned, guaranteeing equal rights of trade (the 'open door') in China to all powers, which moderated the active steps for the 'partition' of China, but the seeds of disorder had been sown and in 1900 the harvest was reaped in the outbreak directed first against the Christian missionaries and eventually against all Europeans, and the lives of the foreign ministers in Peking were imperilled.

Prince Tuan was the leader of the opposition to foreigners. He was an athlete and had many followers of athletic young Chinamen whose ability in sports led to their being known as Boxers. This name was adopted by Tuan's recruits. He proclaimed his nine-year-old son heir-presumptive to the throne. The emperor was but a puppet directed by the Dowager Empress and was not popular. The latter had not opposed the foreign encroachments. Finally the Boxers revolted. Reports of outrages and massacres and ignorance as to the fate of the legations decided the United States, British, French, German, Italian and Japanese governments to take concerted action and warships were hurried to China. The landing of marines at Tokio was stubbornly resisted and the vessels of the allied powers, except the United States, shelled the forts, and after a sanguinary encounter captured them on June 17th. United States troops were sent from Manila. On June 20th, the German Minister, Baron von Ketteler, was set upon and slaughtered by Chinese soldiers while on his way to the Tsung-li-Yamen, in Peking. Vice-admiral Seymour on the same day, was turned back while marching on Peking to relieve the British legation officials and suffered casualties of

374. The allied warships shelled Tien-Tsin on June 21st and on the 23d their combined forces occupied the foreign quarters of the city. On the same day Minister Wu, at Washington, requested an armistice on behalf of his government, in response to which the United States required that as a preliminary free communication be allowed with the legations at Peking. On July 13-14th the allied forces stormed the port of Tien-Tsin and captured it with a loss of 800 in killed and wounded. Five days later the Chinese Emperor solicited peace from President McKinley. The allied forces advanced upon Peking on August 4th under the command of Field Marshal von Waldersee, of the German army. The first word from the beleaguered foreigners was a message in cipher from United States Minister Conger, which, while reporting the safety of members of the legation, represented the appalling conditions prevailing and the imminent danger of the besieged foreigners. On August 8th Li Hung Chang was named Envoy Extraordinary to propose to the powers terms for the immediate cessation of hostile demonstrations. The allied forces captured Peking on August 14th, the Americans being the first to enter and furnishing the first victim in that city in Captain Reilly. Meantime the Emperor and the Dowager Empress had fled for safety. At once the besieged in the legations were were relieved. On the 16th an armistice was refused and the United States rejected the appeal of Li Hung Chang and insisted on compliance with the demands it made. Full power to act was conferred on General Chaffee. The American refugees from Peking reached Tien-Tsin in safety on August 25th. Negotiations for terms of peace and compensation were carried on till December, when the conditions imposed by the allies were accepted by the Chinese government. The American cavalry and artillery evacuated Peking on May 5th. A formal indemnity of 450,000 taels (about $300,000), in pursuance of the terms of settlement, was demanded by the powers on May, 9th which was agreed to by China, and on July 26th the powers agreed to the discharge of this sum by installments, the outstanding amount to bear interest at the rate of 4½ per cent. On September 17th, the occupying forces, United States and Japanese troops, restored the forbidden city to the Chinese. The liquidation of the indemnity payment is still in process (1917), and certain of the powers interested, including the United States and Great Britain, have agreed to postpone or forego the payments due them as a concession to China for her co-operation against Germany in the great war.

**Box-hauling,** the art of turning a ship when it is so situated that tacking is impossible. The operation is effected by hauling the head sheets to windward, bracing the head yards back and squaring the after-yards; the helm being put a-lee. *Boxing off* is a similar operation.

**Boxing** (boks'ing), or PUGILISM, fighting with the fist, an art somewhat common in all ages. The art of boxing consists in showing skill in dealing blows with the fist against one's opponent, especially on the upper part of the body, while at the same time one protects one's self. In England professional boxers, who made a livelihood out of their skill in the art, were at one time common, especially during the reigns of the Georges, when persons of the highest rank were sometimes to be seen at pugilistic combats, and 'professors' of the art frequently had members of the nobility among their pupils. It had also a vogue in the United States, though little practised on the continent of Europe. At the gladiatorial shows of the Greeks and Romans boxing was common, but in a more dangerous form, the fist being armed with leather appliances loaded with iron or lead. Pugilistic encounters, however, have now fallen into disrepute, on account of their frequently brutal character, and laws have been passed for their suppression.

**Boxing-day,** the day after Christmas, which has long been held as a holiday in England. It is so called from the practice of giving Christmas *boxes* as presents on that day.

**Boxing the Compass,** in seaman's phrase, the repetition of all the points of the compass in their proper order—an accomplishment required to be attained by all sailors.

**Box-tortoise,** a name given to one of two North American tortoises, genus *Cistūdo*, that can completely shut themselves into their shell.

**Boxtree** (*Buxus sempervirens*), a shrubby evergreen tree, 12 or 15 feet high, order Euphorbiaceæ, a native of Southern Europe, and parts of Asia, with small oval and opposite leaves, and greenish, inconspicuous flowers, male and female on the same tree. It was formerly so common in England as to have given its name to several places—Boxhill, in Surrey, for instance, and Boxley, in Kent. The wood is of a yellowish color, close-grained, very hard and heavy, and admits of a beautiful polish. On these accounts it is much used by turners, wood-carvers, engravers on wood (no wood surpassing it for this purpose), and

mathematical-instrument makers. Flutes and other wind-instruments are formed of it. The box of commerce comes mainly from the regions adjoining the Black Sea and Caspian, and is said to be diminishing in quantity. In gardens and shrubberies box-trees may often be seen clipped into various formal shapes. There is also a dwarf variety reared as an edging for garden walks and the like.

**Boycott.** See *Danbury Hatters' Case.* The United States Supreme Court in handing down its decision in regard to this case in 1908 declared (1) that the Sherman Anti-Trust Act is violated when labor organizations become a conspiracy in restraint of trade; and (2) that individual members of the union can be held liable for damages of three times the amount of the actual loss inflicted, costs and attorney's fees, in case civil action is taken. Laws prohibiting boycotting have been enacted in Arkansas, Colorado, Illinois, Indiana, and Texas. Blacklisting is prohibited in 26 States. Intimidation conspiracy against workingmen and interference with employment are prohibited by laws in 33 States. In 18 States employers are forbidden to exact an agreement from an employee, either verbal or written, not to become a member of a labor organization as a condition to his obtaining employment. In Great Britain boycotting is lawful if not accompanied by violence and if it serves the purpose of improving working conditions.

**Boycotting** (boi'kot-ing), the term is defined by Bouvier: 'A confederation, generally secret, of many persons, whose intent is to injure another by preventing any and all persons from doing business with him through fear of incurring the displeasure, persecution, and vengeance of the conspirators.' The practice had its origin in Ireland during the land troubles of 1880 and 1881. It takes its name from a Captain James Boycott, a Mayo land agent, against whom it was first directed.

The boycott is of particular interest to Americans owing to its connection with the American Federation of Labor, which applied it notably in the strike of the Danbury (Conn.) hatters in 1902. The boycott was both primary and secondary, and it was in this latter application of its power that the American Federation of Labor was allied with it. By this organization it was spread over the country, and thus the labor body came into contact with the Federal authorities, its action being construed under the provisions of the Sherman Law as a combination to restrict inter-state commerce; and this was the view of the supreme court in its decision handed down in the Danbury hat case.

Another illustration of the secondary boycott is given in the case of the Buck's Stove and Range Company *vs.* the American Federation of Labor, in which proceedings were begun to enjoin the boycott against the Buck's Stove and Range Company, and later, proceedings to enforce the injunction, by holding the defendants in contempt of court for violating the injunction. The history of this case is briefly as follows: In March, 1907, the American Federation of Labor pronounced a boycott against the stove company, publishing its name in the 'unfair' list and in the 'we don't patronize' list of its official organ. It took apparently effective means to prevent tradesmen from buying the Buck's product and also to prevent individuals from patronizing tradesmen who dealt in the Buck's output.

**Boydell** (boi'del), JOHN, an English engraver, but chiefly distinguished as an encourager of the fine arts. With the profits of a volume of engravings executed by himself, and published in 1746, he set up as a printseller, and soon established a high reputation as a liberal patron of good artists, with the result that for the first time English prints began to be exported to the Continent. He engaged Reynolds, Opie, West, and other celebrated painters to illustrate Shakespeare's works, and from their pictures was produced a magnificent volume of plates, the *Shakespeare Gallery* (London, Boydell, 1803). He died in 1804.

**Boyer** (bwä-yā), ALEXIS, a French surgeon, born 1757; died 1833. He had a brilliant career as a student, and was appointed first surgeon to Napoleon, receiving at the same time the title of Baron of the Empire.

**Boyer** (bwä-yā), JEAN PIERRE, president of the Republic of Hayti, born in 1776 at Port-au-Prince; died at Paris in 1850. He was a mulatto by birth, but was educated in France. In 1792 he entered the French army, and fought with distinction against the English in San Domingo. It was largely by his efforts that in 1821 all parts of Hayti were brought under one republican government, of which he was chosen president. His administration in its earlier years was wise and energetic, but in 1843 he was driven into exile by a revolt.

**Boyesen** (boi'e-sen), HJALMAR HJORTH, novelist, born at Fredriksværn, Norway, in 1848; died in 1895. He came to the United States in 1869, and was professor of language successively in Urbana University, Cornell University,

and Columbia College. His works, written in English, are *Gunnar, Falconberg, Ilka on the Hill Top, Queen Titania,*

**Boyle** (boil), a town of Ireland, County Roscommon, with a large trade in corn and butter. Boyle Abbey, now in ruins, dates from the twelfth century. Pop. about 2500.

**Boyle,** CHARLES, Earl of Orrery, born 1676; died 1731, was nominally the editor of the edition of the *Epistles of Phalaris,* which led to a famous controversy with Bentley (see *Bentley*), and to Swift's *Battle of the Books.* He served in the army and as a diplomat. The astronomical apparatus called the orrery took its name from him.

**Boyle,** JOHN J., a sculptor, born in New York in 1857. Among his notable works are a seated statue of Benjamin Franklin before the post-office at Philadelphia and several striking conceptions of the American aborigines.

**Boyle,** RICHARD, Earl of Cork, an English statesman, was born in 1566. In 1588 he went to Dublin with little or no money, but with good recommendations, and by prudence and ability he managed to acquire considerable estates. As a clerk of the Council of Munster he distinguished himself by his talents and activity, and became successively a knight and privy-councilor, Baron Boyle of Youghal, Viscount Dungarvan and Earl of Cork. He died in 1643.

**Boyle,** ROBERT, a celebrated natural philosopher, was born at Lismore, Ireland, 1626, and was the seventh son of Richard the first earl of Cork. After finishing his studies at Eton he traveled for some years on the Continent till, in 1644, he settled in the manor of Stalbridge, Dorsetshire, which his father had left him. Here he devoted himself to scientific studies, to chemistry and natural philosophy in particular. He was one of the first members of the society founded in 1645, afterwards known as the Royal Society. At Oxford, to which he had gone in 1652, he occupied himself in making improvements on the air-pump, by means of which he demonstrated the elasticity of air. Although his scientific work shows an accurate, minute, and methodical intellect, in religious matters he was subject to melancholy and fanciful terrors. With the view of settling his faith he began the study of those oriental languages which contain the origins of Christianity, and formed connections with such eminent scholars as Pococke, Clarke, Barlow, etc. He also instituted public lectures, known as the Boyle Lectures, 'for proving the Christian religion against Atheists, Deists, Pagans, Jews, and Mohammedans, not descending to any Controversy amongst Christians themselves.' The first series was delivered by Richard Bentley. Samuel Clarke, Whiston, and F. D. Maurice were among succeeding Boyle lecturers. Boyle died in 1691, and was interred in Westminster Abbey.

**Boyle,** ROGER, Earl of Orrery, brother of Robert Boyle, born in 1621, died in 1679. In Ireland he zealously supported the cause of Charles I, but after the death of the king he retired for a time from public life. At length he accepted a commission from Cromwell, whom he served with zeal and fidelity, and by whom he was highly esteemed. On the death of Cromwell he exerted himself with such dexterity to bring about the royal restoration that Charles II rewarded him with the title of Earl of Orrery.

**Boyle Lectures.** See *Boyle, Robert.*

**Boyle's Law,** otherwise called *Mariotte's Law,* a law in physics to the effect that the volume of a gas will vary inversely to the pressure to which it is subjected, and the density and elastic force are directly as the pressure and inversely as the volume.

**Boyne** (boin), a river of Ireland, which rises in the Bog of Allen, and after a course of 60 miles falls into the Irish Sea 4 miles from Drogheda. It is navigable for barges to Navan, 19 miles from its mouth. Much of its course is marked by fine scenery. About 2 miles west of Drogheda, an obelisk 130 ft. high marks the spot where was fought the battle between the adherents of James II and William III in 1690, in which the latter proved victorious, James being obliged to flee to the continent.

**Boy Scouts,** an organization for the physical and moral improvement of boys, its purpose being to train boys of a proper age in athletic outdoor exercises and also in courtesy and helpfulness to others. This name was given the organization in 1908 by Lieutenant-General Baden-Powell of the British army, but the idea originated with Ernest Thompson Seton, of Connecticut, about ten years earlier, who organized the boys of his vicinity into an association which he called the 'Seton Indians,' giving them the privilege of using his large and well-wooded estate for the purpose of training them in the arts of woodcraft practised by the American Indians, such as following the trail, canoeing, camping out, etc. A sort of tribal organization was formed and exercises

arranged to train the senses and develop powers of endurance in his youthful pupils; efforts also being made to arouse in them sentiments of self-help, self-control, courtesy, honor, obedience to superiors, and ready aid to all in need of assistance. Daniel C. Beard, of Flushing, N. Y., a well-known artist and author in outdoor subjects, followed with the 'Sons of Daniel Boone,' described in his *Boy Pioneers and Sons of Daniel Boone* (1909). The introduction of the organization in England was due to Mr. Seton, who, in 1906 interested General Baden-Powell in the work to such an extent that he resigned from the army and engaged in this new field of activity with such enthusiasm that the system rapidly spread through the British islands. The Boy Scouts there were taught the methods of scouting practised in the army and trained in military discipline, conditions not introduced in the American organizations. This British development of the idea and its new name gave it a wide popularity, Boy Scout groups being formed in many parts of the United States and in several European and South American countries, until a million and more of youthful devotees were enlisted in the work.

In the exercises of the Boy Scouts no idea of competition is encouraged and no rewards are given for superiority in contests of skill; but ability to perform certain severe duties, demanding skill, readiness, sagacity, powers of endurance, quickness of observation, alertness in emergencies, etc., win them certain coveted distinctions. To develop in them desirable mental and moral sentiments they are required to take certain vows, such as; 'Not to rebel'; 'Not to leave a camp-fire without some one to watch it'; 'To protect the song birds, not to disturb their nests or eggs, or to molest squirrels'; 'Not to make a dirty camp, bring firearms into a camp of those under fourteen, or point a weapon at any one'; 'To keep the game laws'; 'Not to smoke' (if under eighteen); 'Not to bring firewater into camp'; 'To play fair'; 'To keep their word of honor sacred,' together with general rules of honor, duty, obedience, loyalty, courtesy, thrift, friendliness, pleasantness of manner, kindness to animals, the performance of some act of friendly aid to others daily, etc. The fact that their training covers such a scope made them prominent as an incipient military body during the European War, and in 1917 a large sum of money was raised by public subscription to aid them in their useful activities.

**Bozrah** (boz'rä), an ancient city of Palestine, east of the Jordan, and about 80 miles south of Damascus. It was the capital of Og, King of Bashan, and subsequently belonged to the tribe of Manasseh. Early in the Christian era it became a flourishing place, and was long a great emporium of trade. It is now a scene of ruins.

**Bozzaris** (bot-sä'ris), MARKO, a hero of the Greek war of independence against the Turks, born about the end of the eighteenth century. After the fall of Suli he retired to the Ionian Islands, from whence he made a vain attempt to deliver his native country. In 1820, when the Turks were trying to reduce their overgrown vassal, Ali Pasha of Janina, to submission, the latter sought aid from the exiled Suliotes, and Marko Bozzaris returned to Epirus. On the outbreak of the war of independence he at once joined the Greek cause, and distinguished himself as much by his patriotism and disinterestedness as by his military skill and personal bravery. In the summer of 1823, when he held the command-in-chief of the Greek forces at Missolonghi, he made a daring night attack on the camp of the Pasha of Scutări, near Karpenisi. The attack was successful; but the triumph of the Greeks was clouded by the fall of the heroic Bozzaris. His deeds are celebrated in the popular songs of Greece.

**Bra** (brä), a town in North Italy, province of Cuneo, with a trade in cattle, grain, wine and silk. Pop. 11,482.

**Brabançonne** (brä-bäṅ-son'), the national song of the Belgians, written during the revolution of 1830 by Jenneval, an actor at the theater of Brussels, and set to music by Campenhout.

**Brabant** (brä-bant' or bra'bant), the central district of the lowlands of Holland and Belgium, extending from the Waal to the sources of the Dyle, and from the Meuse and Limburg plains to the lower Scheldt. It is divided between the kingdoms of Holland and Belgium, into three provinces: 1st, Dutch or North Brabant, area 1977 sq. m.; 2d, Belgian province of Antwerp, area of 1095 sq. m.; and 3d, the Belgian province of South Brabant, area 1276 sq. m. The country is generally a plain, gently sloping to the N. W., and is mainly fertile and well cultivated, agriculture and the rearing of cattle being the principal employment of the inhabitants. In the north the inhabitants are Dutch; in the middle district, Flemings; in the south Walloons. Southward of Brussels the language is French; northward, Dutch and Flemish. In the

5th century Brabant came into possession of the Franks, and after being alternately included in and separated from Lorraine it emerged at length in 1190 as a duchy under a Duke of Brabant. It eventually came by marriage into possession of the Dukes of Burgundy, and passed with the last representative of that line, Mary of Burgundy, to the house of Austria, and finally to Philip II of Spain. In the famous revolt of the Netherlands, caused by the crulties of King Philip and his agent, the Duke of Alva, North Brabant succeeded in asserting its independence, and in 1648 it was incorporated with the United Provinces. South Brabant remained, however, in possession of the Spaniards, and at the peace of Utrecht in 1714 passed again, along with the other southern provinces of the Netherlands, to the imperial house of Austria. See *Belgium*.

**Brace** (brās), CHARLES LORING, author and philanthropist, born at Litchfield, Connecticut, in 1826; died in 1890. He studied theology and in New York took up the question of the education and housing of the poor. He founded the Children's Aid Society in 1853 and acted as its secretary. Through it homes have been found for many thousands of children. He wrote the *Races of the Old World*, *Gesta Christi*, works of travel, etc.

**Bracelet** (brās'let), a kind of ornament usually worn on the wrist, the use of which extends from the most ancient times down to the present, and belongs to all countries, civilized as well as uncivilized. Bracelets were in use in Egypt and amongst the Medes and Persians at a very remote period, and in the Bible the bracelet is frequently mentioned as an ornament in use among the Jews, both men and women. Among the ancient Greeks bracelets seem to have been worn only by the women. The spiral form was preferred, and very often made to assume the appearance of snakes, which went round the arm twice or thrice. Among the Romans it was a frequent practice for a general to bestow bracelets on soldiers who had distinguished themselves by their valor. Roman ladies of high rank frequently wore them both on the wrist and on the upper arm. Among the ancient heathen Germanic tribes they formed the chief and almost only ornament, as is shown by their being so often found in old graves. They seem to have been used by the men even more than by the women, and were the gifts by which an ancient German chief attached his followers to himself. So, in old Anglo-Saxon poems, 'ring-giver' is a common name for the lord or ruler.

**Braces** (brā'ses), in ships, ropes passing through blocks at the ends of the yards, used for swinging the latter round so as to meet the wind in any desired direction.

**Brachiopoda** (bra-ki-op'o-da), a class of shell-bearing animals having affinities with the worms and the polyzoa, but less with the mollusca, though their bivalve shells give them an outward resemblance to the lamellibranchiata. Their name comes from the development of a long spirally-coiled, fringed appendage or arm on either side of the mouth (Gr. *brachiŏn*, an arm, and *pous*, *podos*, a foot), serving as respiratory organs. They have no proper power of locomotion, and remain fixed to submarine bodies, in some cases by a peduncle passing through an aperture at the 'beak.' They are widely diffused, and in the fossil state are interesting to the geologist by enabling him to identify certain strata. They were vastly more abundant in the early geological ages than at present, especially in Silurian and Devonian times, and again became numerous in the Chalk period, then decreasing to the present time. The chief genera are *Lingula*, *Terebatula*, and *Rhynchonella*.

**Brachycephalic** (bra-ki-se-fal'ik; Gr. *brachys*, short, *kephalē*, the head), a term applied in ethnology to heads whose diameter from side to side is not much less than from front to back, as markedly occurs in the Mongolian type: opposed to *dolichocephalic*.

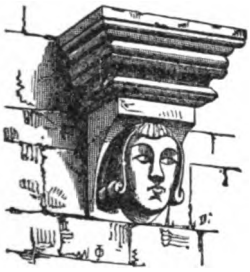
**Brachypteræ** (bra-kip'te-rē; 'short-winged'), a name given to a family of web-footed birds, penguins, auks, divers, guillemots, etc., in which the wings are short and the legs placed far back in the body. They are all strong divers and swimmers.

**Brachyura** (bra-ki-ū'ra; 'short-tailed'), a section of the ten-footed crustaceans or crabs (Decapoda), having a very short jointed tail folded closely under the thorax as in the common crab.

**Bracken,** BRAKE, *Pteris aquilina*, a species of fern very common in America and Europe, and often covering large areas on hillsides and waste grounds. It has a black creeping rhizome, with branched pinnate fronds growing often to the height of several feet, and it forms an excellent covert for game. The rhizome is bitter, but has been eaten in times of famine. The plant is astringent and anthelmintic; when burned it yields a great deal of alkali. The rhizome of *Pteris esculenta*, a native of New

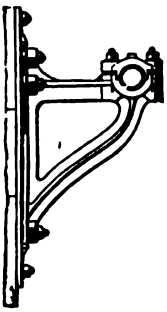
Zealand, was formerly a staple article of food among the Maories.

**Bracket,** a short piece or combination of pieces, generally more or less triangular in outline, and projecting



Bracket, Harlestone Church, Northamptonshire.

from a wall or other surface. They may be either of an ornamental order, as when designed to support a statue, a bust, or such like, or plain forms of carpentry, such as support shelves, etc. Brackets may also be used in connection with machinery, being attached to walls, beams, etc., to support a line of shafting.



Wall-bracket.

**Bract,** a leaf from the axil of which a flower or flower-stalk proceeds, thus distinguished from the ordinary leaf, from the axil of which the leaf-bud proceeds. If differs from other leaves in shape or color, and is generally situated on the peduncle near the flower. It is sometimes called also the floral leaf.

**Bracteates** (brak'tē-āẗz), old thin coins of gold or silver, with irregular figures on them, stamped upon one surface only, so that the impression appears raised on one side while the other appears hollow.—*Bracteated* coins, coins of iron, copper, or brass, covered over with a thin plate of some richer metal, such as gold or silver.

**Bracton** (brak'ton), HENRY DE, one of the earliest writers on English law, flourished in the 13th century. He studied law at Oxford, became a judge, and afterwards chief justice of England. His principal work is entitled *De Consuetudinibus et Legibus Angliæ*.

**Braddock** (brad'dok), a borough of Allegheny Co., Pennsylvania, 10 miles S. E. of Pittsburgh, at the location of Braddock's defeat (see following article). Here is one of the largest steel plants of the country and manufactures having to do with railroading. Pop. 19,357.

**Braddock,** EDWARD, major-general and commander of the British and colonial forces in the expedition against the French on the river Ohio, in 1755. In the spring of that year he set out from Virginia to invest Fort Duquesne, on the site of the present Pittsburgh, but from want of caution, and in disregard of the advice of Washington, who accompanied him, he fell into an Indian ambuscade by which he lost nearly one-half of his troops and received himself a mortal wound.

**Braddon** (brad'on), MARY ELIZABETH, a well-known novelist, born in London in 1837, and daughter of a solicitor there. After publishing some poems and tales, in 1862 she brought out *Lady Audley's Secret*, the first of a series of clever sensational novels. She also wrote poems and became the editor of the London magazine *Belgravia*. D. 1915.

**Bradford** (brad'furd), a municipal and parl. borough and important manufacturing town in West Riding of Yorkshire, England. The more modern portion has well-built streets, and since 1861 extensive street improvements have been carried out. There is a large number of scientific, educational, and charitable institutions, amongst which may be mentioned the new technical college, the free grammar school endowed by Charles II, the fever hospital, built at a great cost, and the almshouses of the Tradesmen's Benevolent Society. There are several public parks, and an extensive system of water-works. Bradford is the chief seat in England of the spinning and weaving of worsted yarn and woolens. Pop. (1911) 288,505.

**Bradford,** a city of McKean County, Pennsylvania, 78 miles S. of Buffalo. It is the center of an extensive oil district, and has large oil interests, pipe lines to the seaboard, and numerous manufactures, including oxalic acid. Pop. 14,544.

**Bradford-on-Avon,** or Great Bradford, an ancient town of England, in Wiltshire, 28 miles N. W. of Salisbury, beautifully situated on the banks of the Lower Avon. Pop. 4501.

**Bradlaugh** (brad'la), CHARLES, secularist, atheist, and advocate of republicanism, born at London in 1833. Being elected to Parliament for Northampton in 1880, he claimed the right to make affirmation simply, instead

of taking the oath which members of parliament take before they can sit and vote, but being a professed atheist this right was denied him. Though he was repeatedly re-elected by the same constituency, the majority of the House of Commons continued to declare him disqualified for taking the oath or affirming; and it was only after the election of a new parliament in 1885 that he was allowed to take his seat without opposition as a representative of Northampton. He was editor of the *National Reformer*. Died in 1891.

**Bradley** (brad'li), JAMES, astronomer, born at Sherborne, England, in 1692. He studied theology at Oxford, and took orders; but devoting himself to astronomy, he was appointed, in 1721, professor of that science at Oxford. Six years afterwards he made known his discovery of the aberration of light, and his researches for many years were chiefly directed towards finding out methods for determining precisely the quantity of aberration. It is largely owing to Bradley's discoveries that astronomers have since been able to make up astronomical tables with the necessary accuracy. In 1741 he was made astronomer-royal, and removed to Greenwich. He died in 1762. His *Astronomical Observations* were published at Oxford in 1805.

**Bradshaw** (brad'shą), JOHN, president of the High Court of Justice which tried and condemned Charles I of England. He studied law at Gray's Inn and attained a fair practice. When the king's trial was determined upon, Bradshaw was appointed president of the court; and his stern and unbending deportment at the trial did not disappoint expectation. Afterwards he opposed Cromwell and the Protectorate, and was in consequence deprived of the chief-justiceship of Chester. On the death of Cromwell he became lord-president of the council and died in 1659. At the Restoration his body was exhumed and hung on a gibbet with those of Cromwell and Ireton.

**Bradshaw's Railway Guide,** a well-known English manual for travelers, first issued by a George Bradshaw, a printer and engraver of Manchester, in 1839. It is now published on the 1st of each month, and contains the latest arrangements of railway and steamboat companies, besides other useful information. There are now many such handbooks in the field, and the idea has since been further developed in the descriptive handbooks of Murray, Baedeker, and others.

**Bradwardin** (brad-wär'din), THOMAS, Doctor Profundus, Archbishop of Canterbury, born about 1290; died in 1349. He was distinguished for his varied learning, and more particularly for his treatise *De Causa Dei contra Pelagium*, an extensive work against the Pelagian heresy, for centuries a standard authority. He was chaplain and confessor to Edward III, whom he accompanied to France, being present at Crécy and the capture of Calais. Being appointed archbishop, he hastened to England, but died of the black death on reaching London.

**Brady,** CYRUS TOWNSEND, clergyman and author, was born in Allegheny, Pa., in 1861. After being in railroad service he became a clergyman of the P. E. Church, holding various posts, including that of assistant minister of St. Stephen's Church, New York, in 1914. His literary labor began in 1899 and includes very many tales of romance and adventure. He wrote also numerous works dealing with romantic and legendary historical subjects.

**Brady** (brā'di), JAMES T., an eminent lawyer of New York, born in 1815; died in 1869. He became distinguished as counsel for the defense in criminal cases and during the Civil war was a leader of the party known as 'War Democrats.'

**Brad'ypus.** See *Sloth*.

**Braemar** (brā'mar), a Highland district in the s. w. corner of Aberdeenshire. It contains part of the Grampian range with the heights of Ben Macdhui, Cairntoul, Lochnagar, etc. The district has some fine scenery, valleys and hillsides covered with birch and fir, but consists mostly of uncultivated heaths.

**Braga** (brâ'gâ), THEOPHILO, historian, poet, and President of Portugal, was born on the island of São Miguel in the Azores, in 1843. His poetical powers developed early and at 16 he published a collection of sentimental verses, *Folkas Verdes* ('Green Leaves'). He studied law, but continued to write, publishing in 1864 a long epic poem, *Vision of the Ages*. In 1872 he became professor of modern languages in the Curso Superior de Lettres in Lisbon, and here began his great work, *History of Portuguese Literature*, of which 32 volumes have been published. Other works are *Universal History*, *System of Sociology*, *Outlines of Positivistic Philosophy*, etc. On the overthrow of the monarchy in Portugal, October, 1910, he, although without experience in political life, was chosen

president of the new republic, a position which he filled with credit until the election of a new president in 1911.

**Braga** (brä'gä), an ancient town in Northern Portugal, the seat of an archbishop who is Primate of Portugal, charmingly situated on a rising ground and surrounded by walls flanked with towers, and with suburbs outside. It contains an archiepiscopal palace, and a richly ornamented Gothic cathedral of the 13th century, and is a place of considerable trade and manufactures. There still exist remains of a Roman temple, amphitheater, and aqueduct. Pop. 24,309.

**Braganza** (brä-gän'zä), or BRAGAN'ÇA, a town of Portugal, capital of the former province Trasos-montes, with a castle, the ancient seat of the Dukes of Braganza, from whom the late reigning family of Portugal are descended. Pop. 5476. Brazil has two towns of the same name, one in the state of Para, with 17,000 pop. in town and district; the other in Sao Paulo, with sugar mills, in a cattle-raising district. Pop. 10,000.

**Bragg,** BRAXTON, soldier, born in North Carolina in 1817. He graduated at West Point in 1837, served in the artillery through the Seminole and Mexican wars, and retired from the army in 1856 with the rank of lieutenant-colonel. He joined the Confederate army in the civil war as brigadier-general, being promoted major-general in 1862. He commanded a corps at the battle of Shiloh, was promoted general, invaded Kentucky and fought General Buell at Perryville; was defeated by Rosecrans at Stone River, but subsequently defeated Rosecrans at Chickamauga. Grant defeated him in a great battle at Missionary Ridge, in November, 1863, and in December he was relieved from his command. Died in 1876.

**Braham** (brä'am), JOHN, a celebrated tenor singer, of Jewish extraction, was born in London in 1774. He appeared with the greatest success on the leading stages of France, Italy, and the United States, as well as in his own country. He excelled mainly in national songs, such as the *Bay of Biscay, O*, and *The Death of Nelson*, and continued to attract large audiences even when eighty years old. He died in 1856.

**Brahe** (brä'ä), TYCHO, a Danish astronomer, born in 1546 of a noble family; died in 1601. He studied law at Copenhagen and Leipzig, but from 1565 gave himself up to astronomy, and in 1580 built an observatory on the island of Hveen in the Sound, providing it with the best instruments then procurable. Here he developed the planetary system associated with his name, the earth, by his theory, being regarded as the center of the heavenly bodies. After the death of his patron, Frederick II of Denmark, he left his native country in 1597 and went to Germany. Here he was patronized by the Emperor Rudolph, who gave him a yearly allowance and a residence at Prague, where he died. His astronomical works were all written in Latin. He is chiefly notable for his services to practical astronomy, his observations being superior in accuracy to those of his predecessors.

**Brahilow.** See *Braïla.*

**Brahma** (brä'ma), a Sanskrit word signifying (in its neuter form) the Universal Power or ground of all existence, and also (in its masculine form with long final syllable) a particular deity, the first person in the Triad (Brahmä, Vishnu, and Siva) of the

Brahma—Bronze, Indian Museum.

Hindus. The personal god Brahmä is represented as a red or golden-colored figure with four heads and as many arms, and he is often accompanied by the swan or goose. He is the god of the fates, master of life and death, yet he is himself created, and is merely the agent of Brahmä, the Universal Power.

**Brahmanism** (brä'man-izm), the religious and social system of the Hindus, so called because it has been developed and expounded by the sacerdotal caste known as the Brahmans (from *brahman*, 'a potent prayer'; from root *brih or vrih*, 'to increase'). It is founded on the ancient religious writings known as the Vedas and regarded as sacred revelations, of which the Brah-

mans as a body became the custodians and interpreters, being also the officiating priests and the general directors of sacrifices and religious rites. As the priestly caste increased in numbers and power they went on elaborating the ceremonies, and added to the Vedas other writings tending to confirm the pretensions of this now predominant caste, and give them the sanction of a revelation. The earliest supplements to the Vedas are the Brahmanas, more fully explaining the functions of the officiating priests. Both together form the revealed Scriptures of the Hindus. In time the caste of Brahmans came to be accepted as a divine institution, and an elaborate system of rules defining and enforcing by the severest penalties its place as well as that of the inferior castes was promulgated. Other early castes were the Kshattriyas or warriors, and the Vaisyas or cultivators, and it was not without a struggle that the former acknowledged the superiority of the Brahmans. It was by the Brahmans that the Sanskrit literature was developed; and they were not only the priests, theologians, and philosophers, but also the poets, men of science, lawgivers, administrators, and statesmen of the Aryans of India.

The sanctity and inviolability of a Brahman, as given in the priestly code, are maintained by severe penalties. The murder of one of the order, robbing him, etc., are inexpiable sins; even the killing of his cow can only be expiated by a painful penance. A Brahman should pass through four states: First, as Brahmachari, or novice, he begins the study of the sacred Vedas, and is initiated into the privileges and the duties of his caste. He has a right to alms, to exemption from taxes, and from capital and even corporal punishment. Flesh and eggs he is not allowed to eat. Leather, skins of animals, and most animals themselves are impure and not to be touched by him. When manhood comes he ought to marry, and as Grihastha enter the second state, which requires more numerous and minute observances. When he has begotten a son and trained him up for the holy calling he ought to enter the third state, and as Vanaprastha, or inhabitant of the forest, retire from the world for solitary praying and meditation, with severe penances to purify the spirit; but this and the fourth or last state of a Sannyasi, requiring a cruel degree of ascetism, are now seldom reached, and the whole scheme is to be regarded as representing rather the Brahmanical ideal of life than the actual facts.

The worship represented in the oldest Vedic literature is that of natural objects; the sky, personified in the god Indra; the dawn, in Ushas; the various attributes of the sun, in Vishnu, Surya, Agni, etc. These gods were invoked for assistance in the common affairs of life, and were propitiated by offerings which, at first few and simple, afterwards became more complicated and included animal sacrifices. In the later Vedic hymns, the gradual development of a philosophical conception of religion and the problems of being and creation appears, leading to the supplements and commentaries known as the Brahmanas and the Upanishads. In some of the Upanishads the deities of the old Vedic creed are treated as symbolical. Brahma, the supreme soul, is the only reality, the world is regarded as an emanation from him, and the highest good of the soul is to become united with the divine. The necessity for the purification of the soul in order to permit its reunion with the divine nature gave rise to the doctrine of metempsychosis or transmigration.

This philosophical development of Brahmanism was accompanied by a distinct separation between the educated and the vulgar creeds. Whilst from the fifth to the first century B.C. the higher thinkers amongst the Brahmans were developing a philosophy which recognized that there was but one god, the popular creed had concentrated its idea of worship round three great deities—Brahmā, Vishnu, and Siva, who now took the place of the confused old Vedic Pantheon. Brahmā, the creator, though considered the most exalted of the three, was too abstract an idea to become a popular god, and soon sank almost out of notice. Thus the Brahman theology became divided between Vishnu, the preserver, and Siva, the destroyer and reproducer, and the worshipers of these two deities now form the two great religious sects of India. Siva, in his philosophical significance, is the deity chiefly worshiped by the conventional Brahman, while in his aspect of the Destroyer, or in one of his female manifestations, he is the god of the low castes, and often worshiped with degrading rites. But the highly cultivated Brahman is still a pure theist, and the educated Hindu in general professes to regard the special deity he chooses for worship as merely a form under which the One First Cause may be approached.

The sharp division of the people of India into civilized Aryans and rude non-Aryans has had a great influence upon Brahmanism, and thus the spiritual conceptions of the old Vedic creed have been

mixed in modern Hinduism with degrading superstitions and customs belonging to the so-called aboriginal races. Suttee, for example, or the burning of widows, has no authority in the Veda, but like most of the darker features of Hinduism is the result of a compromise which the Brahmanical teachers had to make with the barbarous conceptions of non-Aryan races in India. The Buddhist religion has also had an important influence on the Brahmanic, from which it differs less philosophically than ethically.

The system of caste originally no doubt represented distinctions of race. The early classification of the people was that of 'twice-born' Aryans (priests, warriors, husbandmen) and once-born non-Aryans (serfs); but intermarriages, giving rise to a mixed progeny, and the variety of employments in modern times, have profoundly modified this simple classification. Innumerable minor distinctions have grown up; so that amongst the Brahmans alone there are several hundred castes who cannot intermarry or eat food cooked by each other.

The Brahmans represent the highest culture of India, and as the result of centuries of education and self-restraint have evolved a type of man distinctly superior to the castes around them. They have still great influence, though many are driven into employments inconsistent with the character of their caste.

**Brahmaputra** (brä-ma-pō'tra), a large river of Asia, whose sources, not yet explored, are situated near Lake Manasarovora, in Tibet, near those of the Indus. In Tibet, where it is called the Sanpoo, it flows eastwards north of the Himalayas, and, after taking a sharp bend and passing through these mountains, it emerges in the northeast of Assam as the Dihong; a little farther on it is joined by the Dibong and the Lohit, when the united stream takes the name of Brahmaputra, literally the son of Brahma. After entering Bengal it joins the Ganges at Goalanda, and further on the Meghna, and their united waters flow into the Bay of Bengal. The Brahmaputra is navigable by steamers for about 800 miles from the sea, its total length being, perhaps, 1800 miles.

**Brahmo-Somaj** (brä'mo-sō'maj), or the Theistic Church of India, was founded in 1830 by an enlightened Brahman, Rammohun Roy, who sought to purify his religion from impurities and idolatries. This church, while accepting what religious truth the Vedas are admitted to contain, rejects the idea of their special infallibility, and founds its faith on principles of reason. It has had a large and promising development, and doubtless has been strongly affected by the spread of English education among the Hindus. The members do not in principle recognize the distinction of caste, and have made great efforts to weaken this as well as other prejudices amongst their countrymen.

**Brahms** (brämz), JOHANNES, a noted German composer, born at Hamburg, 1833; died at Vienna, 1897. He wrote in practically every branch except the dramatic, but his symphonies are most representative.

**Braïla** (brä'e-lä or brä-ē'lä), a town in Roumania, formerly a fortress, on the left bank of the Danube, which divides itself here into a number of arms, one of them forming the harbor of the town. The exportation of grain and the sturgeon fisheries are amongst the principal industries in Braïla. Pop. 58,392.

**Braille** (brāl), the method now in general use in printing for the blind, invented by Louis Braille, himself blind and a professor at the Institution for the Young Blind at Paris. Dissatisfied with the line type then in use, he took up one invented by M. Barbier, in which six points were used. By studying and working over this, he devised the simple and beautiful system which bears his name. The Braille signs are arbitrary, consisting of six points placed in an oblong. By varying their positions sixty-two combinations can be made, sufficient for all the letters of the alphabet, and for punctuation, contraction, numerical and other marks. See *Blind*.

**Brails** (brāls), on ships, a name given to all the ropes employed to haul up the bottoms, lower corners, and skirts of the great sails in general.

**Brain** (brān), the center of the nervous system, and the seat of consciousness and volition in man and the higher animals, and hence of what we designate as the mind. It is a soft substance, partly gray and partly whitish, situated in the skull, penetrated by numerous bloodvessels, and invested by three membranes or *meninges*. The outermost, called the *dura mater*, is dense and elastic. The next, the *tunica arachnoidea*, is very thin, and is really double. The third, the *pia mater*, covers the whole surface of the brain, and is full of bloodvessels. The brain consists of two principal parts, connected by bands of fibers. The one, called the *cerebrum*, occupies, in man, the upper part of the head, and is seven or eight times larger than the

other, the *cerebellum*, lying behind and below it. The surface of the brain exhibits the appearance of a series of ridges and furrows, forming what are called the *convolutions*. The cerebrum is divided into two portions, the right and left hemispheres, by the *longitudinal fissure*, the hemispheres being at the same time transversely connected by a band of nervous matter called the *corpus callosum*. The external or grayish substance of the brain is softer than the internal white substance. It consists of nerve cells, while the white substance is composed almost entirely of fibers. The cerebellum lies below the cerebrum, in a peculiar cavity of the skull. It is divided into a right and a left hemisphere, connected by a bridge of nervous matter called the *pons Varolii*, under which is the *medulla oblongata* or continuation of the spinal marrow. Like the cerebrum, it is gray on the outside and whitish within. At the base of the brain are several masses of nervous matter or ganglia known as the *corpora striata* (two), *optic thalami* (two), and *corpora quadrigemina* (four); and there are in it five cavities named *ventricles*. Every part of the brain is exactly symmetrical with the part opposite. Twelve pairs of nerves proceed from the base of the brain, including the nerves for the organs of smell, of sight, of hearing, and of taste, also those for the muscles of the face, those for the cavity of the mouth and for the larynx. When compared with the brain of other animals, the human brain presents striking differences. Even the brain of the higher classes of the inferior vertebrate animals differs from that of man, especially in the degree of development; while among the lower grades there is sometimes, properly speaking, no brain at all, but only nerve ganglia, which correspond to the brain. In size, also, the brain of the lower animals, although sometimes (as in the elephant) actually greater, is always much less when compared with the size of the whole body, and it is found that the size of the brain proportionally to the size of the body is a direct measure of the intelligence of different animals. In man the brain weighs from 2 to 4 lbs., the average weight in male European adults being 49 to 50 oz., or about 1/35th of the weight of the body; in the dog the average weight is about 1/120th of the animal; in the horse 1/450th; and in the sheep 1/250th. The heaviest brain yet known was that of Cuvier—64½ oz. The brain of females weighs 5 oz. less on the average than that of males. The brain attains its highest degree of development earlier than any other part of the body. In old age it loses both in bulk and in weight. Comparatively little is known of the functions of the separate parts of the brain, but, speaking generally, the parts lying in front have functions connected with the intellectual part of man's nature; while the parts lying nearer the back of the head belong more to our merely animal or organic nature. As the central organ of the nervous system the brain is sympathetically affected in nearly all cases of acute disease. Diseases of the brain fall into two classes, according as they exhibit mental characteristics alone or also anatomical disturbances. To the former class belong hypochondria, mania, etc. Amongst the latter may be mentioned meningitis, or inflammation of the membranes of the brain, which seldom occurs without affecting also the substance of the brain, and thus giving rise to phrenitis; hydrocephalus, or water in the head, caused by pressure of water in the cavities of the brain; softening of the brain, frequently the result of chronic inflammation; and plethora or poverty of blood in the brain, which, though opposite diseases, may cause the same symptoms of giddiness.

Brain and Spinal Cord.

**Brain-coral**, coral of the genus *Meandrina*, so called from the rounded shape and convolutions of its often large masses.

**Braine-le-comte** (brān-le-kont), an ancient town in Belgium, province of Hainault, about 20 miles S. S. W. of Brussels, with a handsome church of the 13th century; and breweries, dyeworks, oil and cotton mills, etc. Pop. 8935.

**Brainerd** (brān'erd), a city, county seat of Crow Wing Co., Minnesota, on the Northern Pacific and other railroads. It has railroad shops, foundry, flour mill, shingle and lath mill, brewing, etc. Pop. 8526.

**Braintree** (brān'trē), a post-village of Norfolk Co., Massachusetts, 10 miles S. of Boston. It has granite

quarries and manufactures of linen, filters, leather, etc. Pop. 8066.

**Braintree,** a town of Essex Co., England, 18 miles E. of Bishop Stortford. It has a spacious Gothic church, and crape and silk factories. Pop. 6168.

**Brake** (brāk), a contrivance for retarding or arresting motion. Familiar examples of the brake are shown in the various devices employed on ordinary vehicles, street and railway cars, elevators, hoisting engines, etc. The commonest forms comprise shoe-brakes, by which a block (brake-shoe) fastened to the vehicle is pressed by proper mechanism against the rim of the wheels; band or strap brakes, described below; disk brakes, by which a disk fast on the axle and one on the vehicle are engaged by pressure; cup or cone brakes, on the same principle as the disk type, but with a cone fitting into a cup; electric eddy-current brakes, in which a revolving disk is acted on by an electro-magnet; and electric generator brakes in which an induced current dragging back on the armature resists rotation. Track brakes are sometimes used in conjunction with shoe-brakes on electric cars. They act upon the rail either by friction or by grip. The gripping-jaw type is also used as a safety brake on elevators, and acts by gripping the guide bars. Band brakes are extensively used, chiefly on motor vehicles. They consist essentially of a metal or leather band encircling a smoothly turned hub or rim on the axle. The ends of the band have two forms of connection: In the first, one end is fastened to a fixed support, the other being attached to a lever pivoted in such manner that a pull on the handle results in a multiplied pull on the band. In the second form both ends of the band are attached to the lever, on the same side of the fulcrum at different distances. In this type breaking force is obtained by a slight pull on the lever.

**Bramah** (brā'ma), JOSEPH, the inventor of the Bramah lock, the Bramah press, etc., born in Yorkshire in 1749; died in 1814. He set up business in London as a manufacturer of various small articles in metal-work, and distinguished himself by a long series of inventions, such as improvements in paper-making, fire-engines, printing-machines, etc. He is especially known for an ingeniously constructed lock, and for the hydraulic press (which see).

**Bramante** (brâ-mân'tā), FRANCESCO LAZARI, a great Italian architect, born in 1444; died 1514. His most notable work was the part he had in the building of St. Peter's, at Rome, of which he was the first architect.

**Bramble** (bram'bl); *Rufus fruticōsus*), the name commonly applied to the bush with trailing prickly stems which bears the well-known berries usually called in Scotland brambles, and in England and the United States blackberries. It bears a resemblance to the raspberry, and belongs to the same genus, natural order Rosaceæ. As a wild plant it grows in great abundance, and it is now largely cultivated in the United States with great improvement in the fruit. The flowers do not appear till late in the spring, and the fruit, which is deep purple or almost black in color, does not ripen till late summer. The dewberry is a running variety of the bramble, bearing a sweeter and larger fruit than the ordinary blackberry and ripening earlier.

**Bram'bling,** or BRAMBLE-FINCH, the mountain-finch (*Fringilla montifringilla*), larger than the chaffinch, and very like it. It breeds in the north of Scandinavia and visits the south of Europe in winter.

**Brampton** (bramp'ton), an ancient town of England, County Cumberland, with tweed manufactures and coaling industries. Pop. 7982.

**Bran,** the husky part of wheat separated by the bolter from the flour. Its components are: water, 13; gluten, 19.5; fatty matter, 5; husk with starch, 55; and ashes, 7.5; but the results of different analyses vary considerably. It is employed in feeding cattle, is mixed with white wheat flour to make bran bread, and has been found useful as a manure.

**Branchiæ** (brang'ki-ē). See *Gills*.

**Branchiogasteropoda** (brang-ki-o-gas-tėr-op'o-da), gasteropodous molluscs whose respiration is aquatic, being generally effected by means of external branchiæ or gills. They include a great many animals with univalve shells, as whelks, limpets, coneshells, periwinkles, cowries, etc., also sea-hares, sea-slugs, sea-lemons, and the heteropoda.

**Branchiopoda** (brang-ki-op'o-da), an order of crustaceous animals, so called because their branchiæ, or gills, are situated on the feet. They have one to three masticating jaws, and the head is not distinct from the thorax, which is much reduced in size. They include the water-fleas, trilobites, phyllopods, etc.

**Branchiostoma** (brang-ki-os'to-ma), or LANCELET, also called *Amphioxus*. See *Lancelet*.

**Branco** (brang'kō), RIO, a river of N. Brazil, a tributary of the Rio

Negro, navigable for a distance of 40 miles.

**Brand,** is a provincial name for certain diseases of cereals, applied generically. Thus bunt is called *pepper-brand*, and smut is called *dust-brand*.

**Brandeis** (bran'dēz), LOUIS DEMBITZ, born in Louisville, Ky., November 13, 1856. He studied law and practiced in Boston after 1879. He engaged in many notable cases, opposing the New Haven Railroad monopolies and defending Glavis in the Ballinger-Pinchot investigation. Was counsel for the people in the Boston subway system, etc. Socialistic in his views and a strong reformer, he was appointed by President Wilson to fill a vacancy in the U. S. Supreme Court in 1916.

**Brandes** (bran'des), CARL EDVARD COHEN (1847), a Danish author, brother of Georg Brandes, eminent as a dramatist. His first play, 'Lägemidler,' appeared in 1881. His romance, 'Das Junge Blut,' because of its radical nature, led to controversy and ultimate prosecution and fine.

**Brandes** (brän'dez), GEORG MORRIS COHEN, a famous Danish critic, of Jewish extraction, born at Copenhagen, February 4, 1842. The first of his *Samlede Shrifte* appeared in 1900. His work on *William Shakespeare* was translated by William Archer in 1898.

**Brandenburg** (brän'den-bụrg), a province of Prussia, surrounded mainly by Mecklenburg and the provinces of Pomerania, Posen, Silesia, and Prussian Saxony. The soil consists in many parts of barren sands, heaths, and moors; yet the province produces much grain, as well as fruits, hemp, flax, tobacco, etc., and supports many sheep. The forests are very extensive. The principal streams are the Elbe, the Oder, the Havel, and the Spree. Berlin is locally in Brandenburg. Area, 15,400 sq. miles; population 3,529,839. The Old Mark of Brandenburg was bestowed by the Emperor Charles IV on Frederick of Hohenzollern, and is the center round which the present extensive Kingdom of Prussia has grown up.—The town BRANDENBURG is on the Havel, 35 miles W. S. W. of Berlin. It is divided into three parts—an old town, a new town, and a cathedral town—by the river, and has considerable manufactures, including silk, woolens, leather, etc. Pop. 51,251.

**Brand'ing,** a form of punishment once in use in England for various crimes, but abolished in 1822. It was performed by means of a red-hot iron, and the part which was branded was the cheek, the hand, or some other part of the body. Even after branding had been abolished in all other cases, a milder form of it was for a long time retained in the army as a punishment for desertion, the letter D being marked with ink or gunpowder on the left side of a deserter 2 inches below the armpit. This also has been abolished.

**Brandis** (brän'dis), CHRISTIAN AUGUST, a German scholar, born in 1790; died in 1867. After studying at Kiel and Göttingen he was induced by Niebuhr to accompany him to Rome as secretary to the Prussian embassy. In 1822 he was made professor of philosophy at the University of Bonn. He won a reputation by his *History of Greek and Roman Philosophy*.

**Brand'ling,** is a species of fish, the parr or young of the salmon, so named from its markings being, as it were, branded. The name is also given to a small red worm used for bait in fresh-water fishing.

**Bran'don,** a rising town of Canada, in Manitoba, 134 m. west of Winnipeg. It has various manufactures and wholesale houses. Here are collegiate and normal schools, and Indian industrial school and a government experimental farm. Pop. 18,000.

**Brandt** (brant), or BRANT, SEBASTIAN, author of a famous German satire, the *Narrenschiff*, or *Ship of Fools*. He was born at Strasburg in 1458, and studied law at Basel, dying in 1521. The *Narrenschiff* is written in verse, and is a bold and vigorous satire on the vices and follies of the age. It took the popular taste of its time, and was translated into all the languages of Europe. The *Ship of Fools* by Alexander Barclay (1509) is partly an imitation, partly a translation of it.

**Brandy** (bran'di), the liquor obtained by the distillation of wine or of the refuse of the winepress. It is colorless at first, but usually derives a brownish color from the casks in which it is kept, or from coloring matters added to it. The best brandy is made in France, particularly in the Cognac district in the department of Charente. Much of the so-called brandy sold in Britain and America is made there from more or less coarse whisky, flavored and colored to resemble the real article; and France itself also exports quantities of this stuff. Brandy is often used medicinally as a stimulant, stomachic, and restorative, or in mild diarrhœa. In America various distilled liquors get the name of brandy, as cider brandy, peach brandy.

**Brandywine Creek,** a small river which rises in

the State of Pennsylvania, passes into the State of Delaware, and joins Christiana Creek near Wilmington. It gives its name to a battle fought near it, Sept. 11, 1777, between the British and Americans, in which the latter were defeated.

**Brank,** or BRANKS, an instrument formerly in use in Scotland, and to some extent also in England, as a punishment for scolds. It consisted of an iron frame which went over the head of the offender, and had in front an iron plate which was inserted in the mouth, where it was fixed above the tongue, and kept it perfectly quiet.

Brank.

**Brank'ursine** (brank'ur-sīn). See *Acanthus.*

**Brant,** JOSEPH, Indian name Thayendanega, (tē-en-da-nē'ga), a famous chief of the Mohawk tribe, born in 1742. He fought against the colonists in the Revolution, holding a commission in the British army. After the war he went to England, where he published the *Gospel of Mark* in the Mohawk tongue. Died in 1807. Also see *Brandt.*

**Brant'ford,** a city of Ontario, Canada, on the Grand River (which is navigable), 24 m. W. S. W. of Hamilton; it has railway machine-shops, foundries, and cotton and woolen mills, and an active trade. Pop. (1911) 23,046.

**Brantôme** (brâɴ-tōm), PIERRE DE BOURDEILLES, SEIGNEUR DE, a French writer, born in Périgord about 1540; died in 1614. He was of an old and noble family, and early entered the profession of arms. After a brilliant life in courts and camps he withdrew to his estate in Périgord, and spent his time in writing memoirs, which give an admirable picture of his age, with particulars which a chaster and more fastidious pen could hardly have set down. His memoirs consist of *Vies des Hommes illustres et des grands Capitaines Français; Vies des grands Capitaines Étrangers; Vies des Dames illustres; Vies des Dames galantes.*

**Brasenose** (brās'nōs), one of the colleges of Oxford University, founded by William Smith, Bishop of Lincoln, and Sir Richard Sutton, in 1509. The origin of the name is doubtful, but there is a large nose of brass over the entrance. The college is very rich in endowments.

**Brasidas** (bras'i-das), a Spartan general who during the Peloponnesian war overthrew the Athenian army under Cleon at Amphipolis, but was himself mortally wounded, B.C. 422.

**Brass,** is an alloy of copper and zinc, of a bright-yellow color, and hard, ductile, and malleable. Ordinary brass consists of two parts by weight of copper to one of zinc; but any degree of variation may be obtained by altering the proportions; thus by increasing the quantity of copper we may form *tombac* and *pinchbeck,* and with nearly a seventh more of zinc than copper the compound becomes brittle and of a silver-white color. By increasing the copper, on the other hand, the compound increases in strength and tenacity. Brass which is to be turned or filed is made workable by mixing about 2 per cent of lead in the alloy, which has the effect of hardening the brass and preventing the tool being clogged. For engraving purposes a little tin is usually mixed with the brass. Brass is used for a vast variety of purposes, both useful and ornamental. Birmingham, England, is the chief seat of the copper and brass trade in that country.

**Brassarts** (bras'sarts), pieces of ancient plate armor which united the armor-plates on the shoulder and elbow. Demibrassarts shielded only the front.

**Brasses** (bras'ez), SEPULCHRAL or MONUMENTAL, large plates of brass inlaid in polished slabs of stone, and usually exhibiting the figure of the person intended to be commemorated, either in a carved outline on the plate or in the form of the plate itself. In place of the figure we sometimes find an ornamented cross. The earliest example of these monumental slabs now existing in England is that on the tomb of Sir John D'Abernon (died 1277) at Stoke D'Abernon in Surrey. These brasses are considered of great value in

Brass—Westminster Abbey

giving us an exact picture of the costumes of the time to which they belong.

**Brasseur de Bourbourg** (brä-seur dẽ bör-bör), CHARLES ÉTIENNE, a French writer on American history, archæology, and ethnology, born in 1814; died in 1874. He entered the priesthood, was sent to North America by the Propaganda, and lived and traveled here and in Central America for a number of years, partly in the performance of ecclesiastical functions. Among his works are *Histoire du Canada* (1851), *Histoire des Nations civilisées du Mexique et de l'Amérique Centrale* (1857–58), *Gramatica de la Lengua Quiche* (1862) *Monuments anciens du Mexique* (1864–66), *Études sur le Système graphique et la Langue des Mayas* (1869–70), etc.

**Brassey,** EARL, a noted English naval expert, economist and yachtsman, born in 1836. He was knighted in 1881; first peerage, a barony, in 1886. In 1894 he was made a lord-in-waiting by Queen Victoria. From 1895 to 1900 he held office as Governor of Victoria, Australia. He was created earl in 1911. At the beginning of the European war, Lord Brassey, despite his 78 years of age, joined the Royal Naval Reserve and was sent to the Dardanelles in an advisory capacity. He died February 24, 1918.

**Brassica** (bras'si-ka), an important genus of cruciferous plants, including among its numerous species many of great economical value, as the cabbage, turnip, rape, etc. Owing to the numerous crossed races which have been produced in modern times, the limits of the species have been broken down.

**Brattleboro,** a town of Windham County, Vermont, on Wantastiquet Lake, a body of water formed by damming the Connecticut River. The dam provides water power and there are manufactures of reed and pipe organs, toys, furniture, etc. It is the center of the Vermont maple-sugar industry. Pop 7541.

**Braunsberg** (brounz'berg), a town, Prussia, government of Königsberg, on the Passarge, about 4 miles from its junction with the Frische Haff. Pop. 12,497.

**Brauwer** (brou'ver), ADRIAN. See *Brouwer.*

**Bravi** (brä'vē), the name formerly given in Italy, and particularly in Venice, to those who were ready to hire themselves out to perform any desperate undertaking. The word had the same signification in Spain, and both the word and the persons designated by it were found in France in the reign of Louis XIII and during the minority of Louis XIV. Singular form *Bravo.*

**Bravo** (brä'vō), an Italian adjective used as exclamation of praise in theaters, meaning 'well done! excellent!' The correct usage is to say *bravo* to a man, *brava* to a woman, *bravi* to several persons.

**Bravura Air** (brav-ö'ra), an air so composed as to enable the singer to show his skill in execution by the addition of embellishments, striking cadences, etc.

**Brawn** (brạn), a preparation made from the flesh of swine freed from all bones, formed into a roll, boiled, and pressed. Wiltshire brawn is in much repute.

**Braxy** (brak'si), a disease of sheep, being a plethora of the blood resulting from a change from poor to rich pasturage, usually fatal in a few hours. The flesh of sheep that die of this disease is often eaten in Scotland.

**Bray** (brā), a watering-place in Ireland, partly in County Dublin and partly in Wicklow, picturesquely situated on both banks of the Bray, 12 miles S. E. of Dublin. Pop. about 7000.

**Brazil** (bra-zil'), a republic in South America, occupying a space nearly equal to one-half of that continent; greatest length, E. to W., 2750 miles; greatest length, N. to S., 2660 miles; area estimated at 3,290,671 square miles, or about one-sixth smaller than Europe. It is bounded S. E., E., and N. E. by the Atlantic Ocean, N. by French, Dutch, and English Guiana, and Venezuela; W. and S. W. by Ecuador, Peru, Bolivia, Paraguay, the Argentine Confederation, and the Republic of Uruguay. Brazil is divided politically into 20 states and the federal district of Rio de Janeiro, and has a population of nearly 21,000,000.

The coast has few indentations of importance—the chief being the estuaries of the Amazon and Pará in the north—and good harbors are comparatively few. As a whole, the country may be regarded as having three natural divisions, namely, one belonging to the basin of the Amazon, of the north, another belonging to the La Plata basin of the south, and a third consisting of the east central portion watered by a number of streams directly entering the Atlantic. The Amazon valley is bounded by elevated tablelands which, in the lower course of the river, approach within a comparatively short distance of each other. The characteristic feature of this region is its immense low-lying, forest-covered plains, intersected by a great number of watercourses, and in many parts subject to

annual inundation, the vegetation being of the most luxuriant character, from the heat and frequent rains. The greater part of this vast region is unpopulated except by Indians, and as yet of little commercial importance. The climate, notwithstanding the tropical heat and moisture, is comparatively healthy, and the facility for commerce given by thousands of miles of great navigable streams must in time attract numerous settlers. To some extent this has already taken place in the region of the Lower Amazon. Here the development of a trade in the product of the India-rubber trees, which grow in vast quantities, has attracted thousands of Brazilians from the adjoining provinces, and thus 'has covered thousands of miles of rivers with steamers, and spread a population over vast areas that otherwise would have remained dormant for many years.' This northern part of Brazil is unequaled in the number and magnitude of the streams which compose its river system and connect it with Venezuela, Colombia, Ecuador, Peru, and Bolivia. On the north side the chief affluents of the Amazon are the Rio Negro and the Japura, the former giving through the Cassiquiare continuous water communication with the Orinoco. Amongst the southern affluents which are important as water highways into the interior of Brazil are the Xingu, the Tanajos, the Madeira, the Purus, and the Jurua; the Madeira being the most important, and forming a navigable waterway into Bolivia, except that it is interrupted by falls about 200 miles below where it enters Brazil. The Tocantins is another large stream from the south, which enters the Pará estuary and hardly belongs to the Amazon basin. The forest region of the Amazon occupies about one-fourth of the empire; the rest is made up of undulating tablelands 1000 to 3000 feet above the sea, mountain ranges rising to 10,000 feet, and river valleys.

The great streams belonging to the La Plata basin, in the south, are the Paraguay and Paraná. The watershed between this and the Amazonian basin, near the western boundary of Brazil, is only about 500 feet above sea-level, and here a canoe can be hauled across from a headstream of the Madeira to be launched on one belonging to the Paraguay. It would thus be easy to connect the one system with the other by means of a canal, and so connect the La Plata with the Orinoco. The watershed rises gradually from west to east. The southern part of Brazil is characterized by its low plains or *pampas*, covered with grass or scrub. Its vegetation is of a much less tropical character than in the Amazon basin, and its climate more variable. In many parts of this region there is an admirable field for future colonization, though it is as yet defective in means of transport. Near the coast, in the states of S. Paulo, Rio Grande, and Paraná, there is already a considerable population, much augmented by German and Italian immigration, and chiefly occupied in cattle-raising and agriculture. Railways also have been constructed here and given a great stimulus to trade.

The most important river in eastern Brazil is the San Francisco, which is the great waterway into its interior and after a course of 1800 miles discharges its waters into the Atlantic. Three of the large cities of Brazil, Rio de Janeiro, Pernambuco, and Bahia, are developing a considerable traffic in connection with this stream, which can be utilized as a commercial waterway over a very large extent of territory and thus bring the produce of the interior to the centers of export, whence they are distributed in world-wide trade. Eastern Brazil exhibits a great variety in surface, climate, and productions, and though large tracts consist of arid and sandy tablelands, it contains within itself the greater part of the population, wealth, and industry of the republic.

The chief mountain ranges are near the southeastern coast. The Serra do Mar or Maritime range commences in the far south, and travels close to the coast-line in a northeasterly direction till it reaches Rio de Janeiro and Cape Frio, where it culminates in the Serra dos Orgaos, or Organ Mountains, from 7000 to 8000 feet above the sea, and forming the noblest element in the marvelous scenery of the bay of Rio de Janeiro. West of the Serra do Mar lies the Serra Mantequeira, which farther north is known as the Serra do Espinhaço. Here are the loftiest summits in Brazil, Itatiaia-Assu, the highest of all, being 9823 feet above the sea. Between the sources of the Tocantins and Paraná are the Montes Pyreneos, the second most elevated ridge in Brazil, some of its heights being estimated at from 3000 to 4500 feet above the level of the sea.

As almost the whole of Brazil lies s. of the equator, and in a hemisphere where there is a greater proportion of sea than land, its climate is generally more cool and moist than that of countries in corresponding latitudes in the northern hemisphere. In the s. parts of Brazil, in consequence of the gradual narrowing

of the continent, the climate is of an insular character—cool summers and mild winters. The quantity of rain differs widely in different localities. The N. provinces generally are subject to heavy rains. At Rio, where the climate has been much modified by the clearing away of the forests in the neighborhood, the mean temperature of the year is 74°. At Pernambuco the temperature rarely exceeds 82°; in winter it descends to 68°. Generally the climate of the coastal and upland regions of Brazil is agreeable. In the great Amazonian section perpetual summer reigns, with two seasons, the wet and the dry, the heat being tempered by the forest expanse and the trade wind, which almost constantly blows up the river.

Only an insignificant portion of Brazil is as yet under cultivation. The pastures are of vast extent, and support great herds of horned cattle, one of the principal sources of the wealth of the country. The chief food-supply plants are sugar, coffee, cocoa, rice, tobacco, maize, wheat, manioc (or cassava), beans, bananas, ginger, yams, lemons, oranges, figs, etc.—the first two, sugar and coffee, being the staple products of the country. More coffee, indeed, is produced in Brazil than in all the rest of the world together. In its forests Brazil possesses a great source of wealth. They yield dyewoods and cabinet woods of various kinds, including Brazil-wood, rosewood, fustic, cedar, mahogany, and a variety of others, as also Brazil-nuts, cocoanuts, vegetable ivory, India rubber, copaiba, annatto, piassava fiber, etc. Other vegetable products are vanilla, sarsaparilla, ipecacuanha, cinnamon, and cloves.

The principal domestic animals of Brazil are horned cattle and horses. Sheep are kept only in minor parts, chiefly in the south. Goats and hogs are abundant. The wild animals comprise the puma, jaguar, sloth, porcupine, etc. Monkeys are numerous. Amongst the feathered tribes are the smallest of all birds, the humming-bird, and one of the largest, the rhea, while there are parrots in great variety, tanagers, toucans, and the harpy eagle. The reptiles consist of the boa-constrictor and other species of serpents, some of them venomous, alligators, and fresh-water turtles, the eggs of which yield a valuable food. The insects are, many of them, remarkable for the beauty of their colors and their size, especially the butterflies. They are of vast number and variety, among them large and destructive species of ants, and the scorpion, which attains a length of 6 inches. Among minerals the diamonds and other precious stones of Brazil—emeralds, sapphires, rubies, beryls, etc.—are well known. Gold also is procured in considerable quantities. Other minerals are quicksilver, copper, manganese, iron, lead, tin, antimony, and bismuth. The shores and rivers abound with fish.

The population of Brazil consists of whites, Indians, negroes, and people of mixed blood. The native Brazilians, mostly descendants of the Portuguese settlers, but often with a mixture of Indian or African blood, are said to be greatly wanting in energy. The white population, which is, perhaps, a third of the whole, has in recent years been increased by Italian, Portuguese, and German immigration. The negroes are over 2,000,000 in number, and till 1888 were partly slaves. Of the Indians, some are semicivilized, but others (estimated at 600,000) roam about in a wild state, and are divided into a great many tribes speaking different languages. The state language is Portuguese. Primary education is gratuitous, but the great majority of the people are illiterate, though education is now compulsory in some provinces.

The principal imports are cottons, linens, woolens, machinery, hardware and cutlery, wheat, flour, wine, coals, etc., the manufactured articles and coals being largely from Britain. The exports consist of coffee, rubber, sugar, cotton, hides, cabinet and dye woods, drugs, etc. The main export is coffee, the total value exported in 1912 being $226,276,155. The total value of exports the same year, $362,794,846; of imports $308,243,736. The chief money of account is the gold milreis (1000 reis), equivalent at par to 54.6 cents. A new gold coin is valued at about $5. The length of telegraph lines in Brazil is about 21,000 miles; of railways, 14,500.

The established religion of Brazil was Roman Catholic, under the empire; now there is no state church. The government, until 1889, was hereditary-monarchical; when by a revolution Emperor Dom Pedro II was dethroned and Brazil declared a republic. In 1890 the provisional government convoked a national congress, which, in 1891, established a new constitution, whereby the Brazilian nation, adopting the federative republican form of government, constituted itself as the United States of Brazil. The public debt is stated at about $650,000,000. The revenue, as estimated for 1913, was about $192,729,000. The peace strength of the army is 33,000. The navy consists of 7 modern, 9 old battleships and a few cruisers, torpedo boats, etc.

Brazil was discovered in 1499 by Vincente Yanez Pinçon, one of the companions of Columbus in the service of Spain, and next year was taken possession of by Pedro Alvares de Cabral on behalf of Portugal. The first governor-general was Thome de Sousa, who in 1549 arrived in the Bay of Bahia and established the new city of that name, making it the seat of his government. The usurpation of the crown of Portugal by Philip II left Brazil in a defenseless and neglected condition, and the English, French, and Dutch made successive attempts to obtain a footing. The Dutch were the most persevering, and for a time almost divided the Brazilian territory with the Portuguese. The tyranny of the Dutch governors, however, incited their native and Portuguese subjects to revolt, and after a sanguinary war, in 1654 the Dutch were driven out and the Portuguese remained masters of an undivided Brazil. The value of Brazil to Portugal continued steadily to increase after the discovery of the gold mines in 1698 and of the diamond mines in 1728. The vigorous policy of the Portuguese government under the administration of the Marquis de Pombal (1760–77) did much to open up the interior of Brazil, though his high-handed modes of procedure left amongst the Brazilians a discontent with the home government which took shape in the abortive revolt of 1789. On the invasion of Portugal in 1808 by the French the sovereign of that kingdom, John VI, sailed for Brazil, accompanied by his court and a large body of emigrants. He raised Brazil to the rank of a kingdom, and assumed the title of King of Portugal and Brazil. But on his return to Portugal in 1820 he found the Portuguese Cortes unwilling to grant civil and political equality to the Brazilians—a fact which raised such violent convulsions in Rio Janeiro and other parts of Brazil that Dom Pedro, the king's son, was forced to head the party resolved to make Brazil independent, and in 1822 a national assembly declared the separation of Brazil from Portugal, and appointed Dom Pedro the constitutional emperor. In 1864 began a severe struggle between Brazil and Paraguay, caused principally by the arbitrary conduct of Lopez, the dictator of Paraguay. Brazil had to bear the brunt of the war, which terminated only with the death of Lopez in 1870. This struggle secured the freedom of the navigation of the La Plata river-system. In 1888 slavery was finally abolished. After the revolution of 1889, above mentioned, Marshal da Fonseca became the first president, succeeded in 1891 by Floriano Peixoto. A revolt, led by Admiral Mello, occurred in 1893, during which Rio Janeiro was bombarded and Peixoto's retirement demanded. Brazil in 1910 had a population estimated at over 20,000,000, and its capital, Rio de Janeiro, 1,128,057. The population of the republic includes large settlements of Germans, an isolated element which, it was feared, cherished purposes hostile to the independence of Brazil. This, and a German attack on a Brazilian vessel, led in 1917, to a declaration of war against Germany. Brazil was, however, in no position at that time to take any active part in war, its fleet and army alike being negligible. Thus its influence, as yet, was chiefly moral.

**Brazil,** county seat of Clay Co., Indiana, 16 miles E. N. E. of Terre Haute. There are mines of good coal in the vicinity and the manufactures include clay products, turret machines, tin products, pianos, mining machinery, wire fence and fence machines. Pop. 12,000.

**Brazil-nuts,** The seeds of *Bertholletia excelsa.* See *Bertholletia.*

**Brazil-tea,** a name for *Maté* (which see).

**Brazil-wood,** a kind of wood yielding a red dye, obtained from several trees of the genus *Cæsalpinia,* order Leguminosæ, natives of the West Indies and Central and South America. The best kind is *Cæsalpinia echināta;* other varieties are *C. brasiliensis, C. crista, and C. sappan.* The wood is hard and heavy, and as it takes on a fine polish it is used by cabinet-makers for various purposes, but its principal use is in dyeing red. The dye is obtained by reducing the wood to powder and boiling it in water, when the water receives the red coloring principle, which is a crystallizable substance called *brazilin.* The color is not permanent unless fixed by suitable mordants.

**Braz'ing,** or BRASS-SOLDERING. See *Solder.*

**Brazos** (brä'zōs), a large river of Texas, rising in the N. W. part of the state, and flowing into the Gulf of Mexico, after a course of 900 miles, at a point 40 miles W. S. W. of Galveston. During the rainy reason, from February to May, inclusive, it is navigable by steamboats for about 300 miles.

**Brazza** (brät'sä), an island in the Adriatic, part of Dalmatia, 24 miles long and from 5 to 7 broad, mountainous and well wooded. It produces good wines and oil, almonds, silk, etc. Pop. 24,408.

**Braz'zaville,** a commercial river port of French Congo, seated on the right bank of Stanley Pool, in

the Congo, opposite Leopoldville. Pop. about 5000. Founded by S. de Brazza, a traveler, and governor of French Congo, in 1880.

**Breach** (brēch), the aperture or passage made in the wall of any fortified place by the ordnance of besiegers for the purpose of entering the fortress.—*Breaching batteries* are batteries of heavy guns intended to make a breach.

**Breach,** in law, any violation of a law, or the non-performance of a duty imposed by law. Breaches are of various kinds:—*Breach of Close*, in English law, any entry upon another man's property which is not warranted by being made in the exercise of a right. —*Breach of Covenant*, the act of violating an agreement in a deed either to do or not to do something.—*Breach of Peace* is an offense against the public safety or tranquillity either personally or by inciting others. Breaches of peace are such as affrays, riots, routs, and unlawful assemblies, forcible entry or detainer by violently taking or keeping possession of lands or tenements with menaces, force, and arms; riding, or going, armed with dangerous or unusual weapons, terrifying people; challenging another to fight, or bearing such a challenge, besides certain other offenses.—*Breach of Promise* (of marriage), the failure to implement one's promise to marry a particular person, in consequence of which that person may raise an action for damages, though it is only the woman as a rule that gains damages.—*Breach of Trust* is a violation of duty by a trustee, executor, or any other person in a fiduciary position, as, for instance, when a trustee manages an estate entrusted to him for his own advantage rather than for that of the trust.

**Bread,** is the product of grain meal when kneaded with water into a tough and consistent paste and baked. There are numerous kinds of bread, according to materials and methods of preparation; but all may be divided into two classes: *fermented, leavened*, or *raised*, and *unfermented unleavened*, or *not raised*. The latter is the simplest, and no doubt was the original kind, and is still exemplified by biscuits, the oat-cakes of Scotland, the corn-bread of America, the *dampers* of the Australian colonies, and the still ruder bread of savage races. It was probably by accident that the method of bringing the paste into a state of fermentation was found out, by which its toughness is almost entirely destroyed, and it becomes porous, palatable, and digestible. All the cereals are used in making bread, each zone using those which are native to it. Thus maize, millet, and rice are used for the purpose in the hotter countries, rye, barley, and oats in the colder, and wheat in the intermediate or more temperate regions. In the most advanced countries bread is made from wheat, which makes the lightest and most spongy bread. The fermentation necessary for the ordinary loaf-bread is generally produced by means of leaven or yeast, and the first thing to be done towards the manufacture of a batch of bread is, in the language of the baker, *to stir a ferment*. For this purpose water, yeast, flour, and some potatoes mashed and strained through a colander are mixed together and worked up into a thin paste, in which, on being left to stand for a time, an active fermentation sets in, the carbonic acid generated causing the mixture to rise and fall. In about three hours the fermenting action ceases, and the mixture may now be used, but it is not generally used till at the end of four or five hours. The next operation is called *setting the sponge*. This consists in stirring up the above ferment well, adding some lukewarm water, and mixing in as much flour as will make the whole into a pretty stiff dough, which receives the name of the *sponge*. The sponge, being kept in a warm place, begins to ferment in the course of an hour or so, heaving and swelling up till at last the imprisoned carbonic acid bursts from the mass, which then sinks or collapses. This is called *the first sponge*, and from it the bread may be made; but the fermentation is often allowed to proceed, and the rising and falling to go on a second time, producing what the bakers call *the second sponge*. The next process is called *breaking the sponge*, and consists in adding to it the requisite quantity of water and salt, the sponge being thoroughly mixed up with the water. The remainder of the total quantity of flour intended to be employed is gradually added, and the whole is kneaded into a dough of the due consistency. The dough, being allowed to remain in the trough till it rise or *give proof*, is then weighed off into lumps, which are shaped into loaves and placed in the oven. In the process of baking they swell to about double their original size. The chemical changes which have been taking place during this process may be explained in the following way: An average quality of flour consists of gluten 12, starch 70, sugar 5, gum 3, water 10; total, 100. When water is added to the flour, in the first operation of baking, it unites with the gluten and

starch, and dissolves the gum and sugar. The yeast or barm added acts now upon the dissolved sugar, especially at an elevated temperature, and produces the vinous fermentation, forming alcohol and setting free carbonic acid as a consequence of the transformation of the elements of the sugar. The gaseous carbonic acid is prevented from escaping by the gluten of the mass, and if the mixing or kneading has been properly performed it remains very equally diffused through every part of the dough. The alcohol and carbonic acid are carried into the oven with the dough, and the former partially escapes, while the latter gas, being expanded by the heat, produces the lightness and sponginess of the loaf. It may be produced in bread-making by other means than fermentation, as by some of those well-known preparations called 'baking powders,' which usually contain bicarbonate of potash or of soda, with tartaric acid. *Aërated bread* is so called because made with aërated water—that is, water strongly impregnated with carbonic acid under pressure, the dough being also worked up under pressure and caused to expand by the carbonic acid when the pressure is removed.

The number of grindings which grain receives determines the character and variety of the finished products. Flour is generally classed under the following heads: *Graham*, which is simply wheat meal, the whole of the grain being used; *whole wheat*, the entire grain being used after the removal of the outer branny covering; and *straight patent* or *standard patent*, which contains neither the bran nor germ of the grain, but is nevertheless composed of nearly three-fourths of the kernel.

Various adulterants are used in bread-making, such as chalk, starch, potatoes, etc.; but the commonest is alum, which enables the baker to give to bread of inferior flavor the whiteness of the best bread, and also to keep in the loaf an undue quantity of water, which, of course, increases its weight. Boiled rice is also used for the same purpose. In the making of bread the flour or meal of wheat, barley, rye, oats, buckwheat, Indian corn, rice, beans, pease, and potatoes may be used, along with salt, eggs, water, milk, and leaven or yeast of any kind; but any other ingredient is regarded as an adulteration.

**Breadalbane** (bre-dal'bān), a Highland district in the western part of Perthshire, in the center of the Grampians. It gives his title to the Marquis of Breadalbane, head of a branch of the Campbell family, who is the chief proprietor in the district.

**Breadfruit,** a large globular fruit of a pale-green color, about the size of a child's head, marked on the surface with irregular six-sided depressions, and containing a white and somewhat fibrous pulp, which when ripe becomes juicy and yellow. The tree that produces it (*Artocarpus incisa*) belongs to the order Artocarpaceæ (nearly allied to the Urticaceæ or nettle tribe), and grows wild in Otaheite and other islands of the South Seas, whence it was introduced into the West Indies and S. America. It is about 40 feet high, with large and spreading branches, and has large bright-green leaves deeply divided into seven or nine spear-shaped lobes. The fruit is generally eaten immediately after being gathered, but is also often prepared so as to keep for some time either by baking it whole in close underground pits or by beating it into *paste* and storing it underground, when a slight fermentation takes place. The eatable part lies between the skin and the core, and is somewhat of the consistence of new bread. Mixed with cocoanut milk it makes an excellent pudding. The inner bark of the tree is made into a kind of cloth. The wood is used for the building of boats and for furniture. The jack (*Artocarpus integrifolia*), much used in India and Ceylon, is another member of this genus.

Breadfruit.

**Breadnuts,** the seeds of the *Brosimum alicastrum*, a tree of the same order as the breadfruit (which see). The breadnut tree is a native of Jamaica. Its wood, which resembles mahogany, is useful to cabinet-makers, and its nuts make a pleasant food, in taste not unlike hazelnuts.

**Breadroot,** *Psoralëa esculenta*, a leguminous plant of the United States, with edible farinaceous tubers.

**Break,** or BRAKE, a large four-wheeled vehicle with a straight body and a raised seat in front for the driver, and containing seats for six, eight, or more persons.

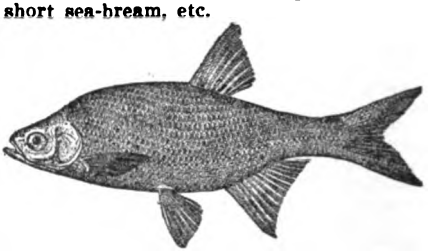
**Break'er,** COAL, an apparatus at the mouth of coal mines to break the lumps of coal into marketable sizes. It consists of great rollers which crush the great masses as they are dumped into its mouth, whence they pass

down its slope after being broken. The pieces as they descend, fall into sieves of various sized mesh thus assorting the different sizes. From the sieves the coal is delivered to long chutes, down which it passes to the bins. All hard coal needs to be treated in this way.

**Breaking bulk,** the act of beginning to unlade a ship, or of discharging the first part of the cargo.

**Break'water,** a work constructed in front of a harbor to serve as a protection against the violence of the waves. The name may also be given to any structure which is erected in the sea with the object of breaking the force of the waves without and producing a calm within. Breakwaters are usually constructed by sinking loads of unwrought stone along the line where they are to be laid, and allowing them to find their angle of repose under the action of the waves. When the mass rises to the surface, or near it, it is surmounted with a pile of masonry, sloped outwards in such a manner as will best enable it to resist the action of the waves. The great breakwaters are those of Cherbourg in France, Plymouth in England, and Delaware Bay in the United States; the last being capable of sheltering 1000 vessels at once. In England those at Holyhead and Portland may also be mentioned as great works of engineering. At Dover a breakwater, begun in 1840, has been completed at an enormous outlay, the great depth and frequent storms being formidable obstacles. In the United States important breakwaters have been constructed at Sandy Bay, Massachusetts, Point Judith, Rhode Island, and San Pedro, California. In less important localities floating breakwaters are occasionally used. These are built of strong open woodwork, partly above and partly under water, divided into several sections, and secured by chains attached to fixed bodies. The breakers lose nearly all their force in passing through the beams of such a structure. A breakwater of this kind may last for twenty-five years.

**Bream** (*Abrămis brama*), a fish sometimes called carp-bream, belonging to the family Cyprinidæ or carps. It is about 2 to 2½ feet long, and of a yellowish-white color. It is found in many European lakes and rivers, and affords good sport to the angler, but is a very coarse and insipid food. It prefers still water with a bottom of soft soil, and feeds both on animal and vegetable matter. The name is also given to various kinds of sea-fishes, mainly of the family Sparidæ, as the black sea-bream, the common sea-bream or gilthead, the short sea-bream, etc.



Bream or Golden Shiner.

**Breaming** (brēm'ing), a nautical term meaning the operation of clearing a ship's bottom by means of fire of the shells, sea-weeds, barnacles, etc., that have become attached to it. It is performed by holding to the hull kindled furze, reeds, or such like light combustibles, so as to soften the pitch and loosen the adherent matters, which may be then easily swept off.

**Breast,** THE FEMALE, is a compound racemose gland provided for the secretion of milk, with excretory ducts, which open by small orifices in the nipple, and discharge the secreted fluid for the nourishment of the child. At the center of each breast there is a small projection, the nipple, and this is surrounded by a dark ring termed the areola. The breast is liable to many diseases, from irritation during nursing, bruises of the part, undue pressure from tight clothes, and from constitutional causes. Among the most common of these is inflammation arising from a superabundant secretion of milk during nursing.

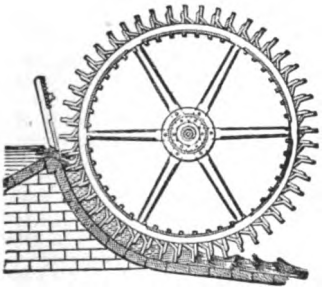
**Breastplate,** a piece of defensive armor covering the breast, made of leather, brass, iron, steel, or other metals. Among the ancient Jews the name was given to a folded piece of rich, embroidered cloth worn by the high-priest. It was set with twelve precious stones bearing the names of the tribes.

**Breast-wheel,** a water-wheel in which the water driving it is delivered to the float-boards between the top and bottom, generally a little below the level of the axis. In this kind of wheel the water acts partly by impulse, partly by weight.

**Breastwork,** in the military art, a hastily-constructed parapet made for protection against the shot of the enemy, generally composed of earth.

**Breath,** the air which issues from the lungs during respiration through the nose and mouth. A smaller

portion of oxygen and a larger portion of carbonic acid are contained in the air which is exhaled than in that which is inhaled. There are also aqueous particles in the breath, which are precipitated by the coldness of the external air in the form of visible vapor; likewise other substances which owe their origin to secretions in the mouth, nose, windpipe, and lungs. These cause the changes in the breath which may be known by the smell. A bad breath is often caused by local affections in the nose, the mouth, or the windpipe; viz. by ulcers in the nose, cancerous polypi, by discharges from the mouth, by sores on the lungs, or peculiar secretions in them. It is also caused by rotten teeth, by impurities in the mouth, and by some kinds of food. The remedies, of course, vary. Frequent washing, gargles of chlorine-water, charcoal, etc., are prescribed according to the disease.



Breast-Wheel.

**Breathing.** See *Respiration.*

**Breccia** (brech'i-a), a rocky mass composed of angular fragments of the same rock or of different rocks united by a matrix or cement. Sometimes a few of the fragments are a little rounded. When rounded stones and angular fragments are united by a cement the aggregate is usually called conglomerate or pudding-stone. *Osseous breccia* is, as its name implies, composed of bones.

**Brechin** (brē'hin), a royal and interesting borough of Scotland, in Forfarshire, finely situated on the South Esk. It has considerable linen manufactures, two distilleries, a paper-mill, etc. It is an old town; was the seat of a Culdee college, and from the 12th century that of a bishop. There is a cathedral which dates back to the 13th century, a plain building, now the parish church, and near it is the tall round tower which, except that at Abernethy, is the only example of this kind of structure in Scotland. Almost in the town and overlooking the river stands Brechin Castle, the ancient seat of the Maules of Panmure (Earls of Dalhousie). Pop. 8941.

**Brecon** (brek'on), or BRECK'NOCK, a mountainous county of South Wales; area 734 square miles. It is very mountainous, and is watered by the Wye, the Usk, the Taf, etc. Though rugged in its surface, nearly half of it is under cultivation or in pasture; and wool, butter, and cattle are sent into the English markets. There are extensive ironworks in the S. E., but it contains only a small part of the coal field which extends into the adjacent counties of Monmouth and Glamorgan. Half the inhabitants still speak Welsh. Pop. in 1901, 54,213; in 1911, 59,298. BRECON, or BRECKNOCK, the capital of the above county, previous to 1885 a parliamentary borough, stands near its center, in an open valley at the confluence of the Honddu and Usk, and in the midst of the grandest scenery of South Wales. The chief trade is in connection with agriculture and the manufacture of iron. Mrs. Siddons and Charles Kemble were natives of Brecon. Pop. 5908.

**Breda** (brā-dä'), a town in Holland, province of North Brabant, at the confluence of the Merk and the Aa. Breda was once a strong fortress and of great military importance as a strategical position. From the 16th to the end of the 18th century Breda has an interesting military history of sieges, assaults, and captures, with which the names of the most famous generals of their time, the Duke of Parma, Maurice of Orange, the Marquis Spinola, Dumouriez, and Pichegru, etc., are connected. It was the residence for a time of the exiled Charles II of England, and it was in the Declaration of Breda that he promised liberty of conscience, a general amnesty, etc., on his restoration. Pop. 26,897.

**Bree** (brā), MATTHÆUS IGNAZIUS VAN, a Flemish painter, born in 1773; died in 1839. He painted the *Death of Cato* and other classical subjects, as well as scenes pertaining to modern history.

**Breckinridge** (brek'in-rij), JOHN CABELL, statesman and soldier, born near Lexington, Kentucky, in 1821; died in 1875. He was elected to Congress from Kentucky by the Democratic party in 1851 and 1853, and in 1856 was elected Vice-President with James Buchanan as President. He was nominated for President in 1860 by the Southern Democrats and received seventy-two electoral votes. Subsequently elected to the Senate, he took his

seat in March, 1861, but went South in September and took arms as a brigadier-general in the Confederate army. In 1865 he was made Confederate Secretary of War. After the surrender of Lee he went to Europe, but returned in 1868.

**Breech,** BREECH-LOADING. The breech is the solid mass of metal behind the bore of a gun, and that by which the shock of the explosion is principally sustained. In breech-loading arms the charge is introduced here, there being a mechanism by which the breech can be opened and closed. In small arms the advantages of breech-loading for rapidity of fire, facility of cleaning, etc., have recently recommended it to general use, and its efficacy for military purposes was effectively demonstrated by the Prussian campaigns against Denmark and Austria in 1864 and 1866. Since that time every government has adopted the new system, both in small arms and heavy ordnance, while breech-loading sporting arms are also in general use. The chief difficulty in breech-loading is to close the breech so as to prevent the escape of the highly elastic gas to which the force of the explosion is due, but the appliances of modern science and mechanical art may be said to have effectually met this difficulty. See *Cannon*, *Cartridge*, *Musket*, etc.

**Breeches** (brĕch'ez), an article of clothing for the legs and lower part of the body in use among the Babylonians and other ancient peoples as well as among the moderns. In Europe we find them first used among the Gauls; hence the Romans called a part of Gaul, *breeched Gaul* (*Gallia braccāta*). Trousers are longer and looser than the breeches that used to be worn.

**Breeching** (brĕch'ing), a rope to secure a ship's gun and prevent it from recoiling too much in battle.

**Breeding** (brēd'ing), the art of improving races or *breeds* of domestic animals, or modifying them in certain directions, by continuous attention to their pairing in conjunction with a similar attention to their feeding and general treatment. Animals (and plants no less) show great susceptibility of modification under systematic cultivation; and there can be no doubt that by such cultivation the sum of desirable qualities in particular races has been greatly increased, and that in two ways. Individual specimens are produced possessing more good qualities than can be found in any one specimen of the original stock; and from the same stock many varieties are taken characterized by different perfections, the germs of all of which may have been in the original stock but could not have been simultaneously developed in a single specimen. But when an effort is made to develop rapidly, or to its extreme limit, any particular quality, it is always done at the expense of some other quality, or of other qualities generally, by which the intrinsic value of the result is necessarily affected. High speed in horses, for example, is only attained at the expense of a sacrifice of strength and power of endurance. So the celebrated merino sheep are the result of a system of breeding which reduces the general size and vigor of the animal, and diminishes the value of the carcass in favor of that of the wool. Much care and judgment, therefore, are needed in breeding, not only in order to produce a particular effect, but also to produce it with the least sacrifice of other qualities.

Breeding as a means of improving domestic animals has been practised more or less systematically wherever any attention has been paid to the care of live stock, and nowhere have more satisfactory results been obtained than in Britain. One of the earliest improvers in Britain was Robert Bakewell, of Dishley, in Leicestershire, who commenced his experiments about 1745, and was very successful, especially with sheep, the celebrated Dishley breed of Leicestershire sheep having since maintained a high reputation. Quantity of meat, smallness of bone, lightness of offal; in cows, yield and quality of milk; in sheep, weight of fleece and fineness of wool, have all been studied with remarkable effects by modern breeders.

**Breeze,** BREEZE-FLY, a name given to various flies, otherwise called gadflies, horseflies, etc.

**Breezes,** SEA and LAND. See *Wind*.

**Bregenz** (brā'gents), the chief town of Vorarlberg, Austrian Empire, 77 miles W. by N. of Innsbruck, beautifully situated on a slope which rises from the Lake of Constance. It is the ancient *Brigantium* and was once of importance as a fortified place. Pop. 7595.

**Brehons** (brē'hons), ancient magistrates among the Irish. They were hereditary, had lands assigned for their maintenance, and administered justice to their respective tribes—each tribe had one brehon—seated in the open air upon some hill or eminence. Brehon law was reduced to writing at a very early period, as is evident from the antiquity of the language in which it is written, and in the earliest manuscripts

we find allusions to a revision of it said to have been made in the 5th century by St. Patrick and other learned men, who are said to have expunged from it the traces of heathenism, and formed it into a code called the Senchus Mor. The Brehon law was exclusively in force in Ireland until the year 1170. It was finally abolished by James I in 1605.

**Breisach** (brī'zȧh), a small though ancient town of Southern Germany, on the Rhine, in Baden, formerly a free imperial city, and a fortress of importance down to the middle of the 18th century, often being a scene of warlike operations. It is often called Old Breisach, in opposition to New Breisach, a fortress on the opposite side of the river, in Alsace. Pop. 3537.

**Breisgau** (brīs'gou), one of the most fertile and picturesque districts of Germany, in the south of Baden, in the Rhine valley, containing part of the Black Forest. Chief town, Freiburg.

**Breitenfeld** (brī'tn-felt), a village of Germany, in Saxony, 4 miles N. of Leipzig, notable as the scene of two battles of the Thirty Years' war, the first gained by Gustavus Adolphus over Tilly and Pappenheim in 1631; the second by the Swedish general Torstenson over the Imperialists commanded by Archduke Leopold and Piccolomini in 1642.

**Bremen** (brā'men), a free city of Germany, an independent member of the empire, one of the three Hanse towns, on the Weser, about 50 miles from its mouth, in its own small territory of 98 sq. miles, besides which it possesses the port of Bremerhaven at the mouth of the river. The town is partly on the right, partly on the left bank of the Weser, the larger portion being on the former. Here is the old and business section of the town, the streets of which are narrow and crooked, and lined with antique houses, and which contains the cathedral, founded about 1050, the old Gothic council-house, with the famous wine cellar below it, the town hall, the merchants' house, and the old and the new exchange. The Vorstadt, or suburbs lying on the right bank outside the ramparts of the old town, are now very extensive. The manufacturing establishments consist of tobacco and cigar factories, sugar refineries, rice mills, iron-foundries, machine-works, rope and sail works, and shipbuilding yards. Its situation renders Bremen the emporium for Hanover, Brunswick, Hesse, and other countries traversed by the Weser, and next to Hamburg it is the principal seat of the export and import and emigration trade of Germany. Only small vessels can come up to the town itself; the great bulk of the shipping trade centers in Bremerhaven and Geestemünde. Bremerhaven is now a place of over 20,000 inhabitants, has docks capable of receiving the largest vessels and is connected by railway with Bremen, where the chief merchants and brokers have their offices. The chief imports are tobacco, raw cotton and cotton goods, wool and woolen goods, rice, coffee, grain, petroleum, etc., which are chiefly reëxported to other parts of Germany and the Continent. Pop. of town (1910) 246,827; of total territory 263,440.

Bremen was made a bishopric by Charlemagne about 788, was afterwards made an archbishopric, and by the end of the fourteenth century had become virtually a free imperial city. The constitution is in most respects republican. The legislative authority is shared by a senate of sixteen citizens elected for life, and an assembly of 150 citizens elected for six years. The executive lies with the senate and senatorial committees.

**Bremer** (brē'mer), FREDERIKA, a Swedish novelist, was born near Abo in Finland in 1802 and died in 1865. She early visited Paris, and at subsequent periods of her life, up to 1861, she traveled in America, England, Switzerland, Italy, Turkey, Greece, and Palestine. She also resided for some time in Norway. She wrote an account of her travels; but her fame chiefly rests on her novels, which were translated into German and French, and into English by Mary Howitt. Among the chief of these are *Neighbors*, *The President's Daughters*, *Nina*, and *Strife and Peace*.

**Brenham** (bren'am), a city, capital of Washington Co., Texas, 93 miles E. of Austin. It has important cotton industries, etc., and is a shipping point for cotton, grain and livestock. Pop. 4718.

**Brenner** (bren'ner), a mountain in the Tyrolese Alps between Innsbruck and Sterzing; height, 6777 feet. The road from Germany to Italy, traversing this mountain, reaches the elevation of 4658 feet, and is one of the lowest roads practicable for carriages over the main chain of the Alps. A railway through this route was opened in 1867.

**Brennus** (bren'nus), the name or title of several princes of the ancient Gauls, of whom the most famous was the leader of the Senones, who invaded the Roman territory about the year 390 B.C. He conquered Etruria from Ravenna to Picenum, besieged Clusium, defeated the Romans near the

Allia, sacked Rome, and besieged the capitol for six months, but ultimately retired on payment of a large amount of gold. According to Polybius the Gauls returned home in safety with their booty; but according to Livy, Brennus was disastrously defeated by Camillus, a distinguished Roman exile who arrived in time to save the capitol.

**Brent,** CHARLES HENRY, a Protestant Episcopal prelate, born at New Castle, Ontario, April 9, 1862; educated at Trinity College, Toronto. He held charges in Buffalo and Boston and was elected bishop of the Philippines in 1901. In 1908 he declined the bishopric of Washington. His works include *With God in the World* (1889); *The Consolations of the Cross* (1902); *With God in Prayer* (1907); *The Sixth Sense* (1912).

**Brenta** (bren'ta), a river in North Italy, falling after a winding course of 112 miles, into the Adriatic. Formerly its embouchure was at Fusina, opposite Venice; but a new course was made for it.

**Brentano** (bren-tä'nō), CLEMENS, a German poet and romancer, born in 1777; died in 1842. He studied at Jena, and resided successively at Frankfort, Heidelberg, Vienna, and Berlin. In 1818 he retired to the convent of Dülmen, in Münster, and the latter years of his eccentric life were spent at Ratisbon, Munich, and Frankfort-on-the-Main. He had a powerful imagination, and his works display an elaborate satirical humor, but a curious vein of mysticism and misanthropy run through them. He was the brother of Elizabeth von Arnim, Goethe's 'Bettina.' Among his principal works are—*Satires and Poetical Fancies; Ponce de Leon*, drama; *The Founding of Prague*, drama; *History of the Brave Caspar and the Fair Annerl*, an admirable novelette; *Gokel, Hinkel, und Gakeleia*, a satire on the times, etc.

**Brentford** (brent'ford), a manufacturing town of Middlesex, England, 7 miles w. of London, with sawmills, pottery-works, foundries, etc., and great waterworks for London. Here Edmund Ironside defeated Canute in 1016; and Prince Rupert, Colonel Hollis, in 1642. Pop. (1911) 16,584.

**Brent Goose** (*Anser brenta* or *bernicla*), a wild goose, smaller than the common barnacle goose and of much darker plumage, remarkable for length of wing and extent of migratory power, being a winter bird of passage in France, Germany, Holland, Great Britain, the United States, Canada, etc. It breeds in high northern latitudes; it feeds on drifting sea-weeds and saline plants, and is considered the most delicate for the table of all the goose tribe.

**Brescia** (brā'shē-ä; Latin, *Brixia*), a city of North Italy, capital of the province of the same name, is beautifully situated at the foot of the Alps, and is of a quadrilateral form, about 4 miles in circuit. Its public buildings, particularly its churches, are remarkable for the number and value of their frescoes and pictures. Among the chief edifices are the new cathedral, a handsome structure of white marble, begun in 1604, the Rotonda, or old cathedral, the town-hall (La Loggia), and the Broletto, or courts. The city contains a museum of antiquities, picture-gallery, botanic garden, a fine public library, a theater, hospital, etc. An aqueduct supplies water to its numerous fountains. Near the town are large ironworks, and its firearms are esteemed the best that are made in Italy. It has also silk, linen, and paper factories, tan-yards, and oil-mills, and is an important mart for raw silk. Brescia was the seat of a school of painting of great merit, including Alessandro Bonvicino, commonly called 'Il Moretto,' who flourished in the 16th century. The city was originally the chief town of the Cenomanni, and became the seat of a Roman colony under Augustus about B.C. 15. It was burned by the Goths in 412, was again destroyed by Attila, was taken by Charlemagne in 774, and was declared a free city by Otho I of Saxony in 936. In 1426 it put itself under the protection of Venice. In 1796 it was taken by the French, and was assigned to Austria by the Vienna treaty of 1815. In 1849 its streets were barricaded by insurgents, but were carried by the Austrians under General Haynau. It was ceded to Sardinia by the treaty of Zürich, 1859. Pop. 70,614. The province has an area of 1845 sq. miles; pop. 841,765.

**Breslau** (bres'lou), a large city in the German Empire and in the Prussian dominions, ranking with Berlin, Hamburg, Leipsic, Cologne, and Dresden. It is the capital of the province of Silesia, and is situated on both sides of the Oder. The public squares and buildings are handsome, and the fortifications have been converted into fine promenades. The cathedral, built in the 12th century, and the Rathhaus, or town-hall, a Gothic structure of about the 14th century, are among the most remarkable buildings. There is a flourishing university, with a museum, library of 400,000 volumes, observatory, etc. Breslau has manufactures of machinery, railway-

carriages, furniture and cabinet ware, cigars, spirits and liqueurs, cotton and woolen yarn, musical instruments, porcelain, glass, etc., and carries on an extensive trade. Breslau was the seat of a bishopric by the year 1000; an independent duchy from 1163 to 1335; then belonged to Bohemia; and was ceded to Austria in 1527. In 1741 it was conquered by Frederick II of Prussia. Pop. (1910) 511,891.

**Bressay** (bres'sȧ), one of the Shetland Isles, E. of Mainland, from which it is separated by Bressay Sound, about 6 miles long and 1½ in breadth. Its line of coast is rocky and deeply indented; its interior is hilly and largely covered with peat-moss. Seafishing is the principal occupation, kelp and hosiery are manufactured, and quarries of coarse slate are wrought. Pop. about 800.

**Brest,** a seaport in the N. W. of France, department of Finistère. It has one of the best harbors in France, and is the chief station of the French marine, having safe roads capable of containing 500 men-of-war in from 8 to 15 fathoms at low water. The entrance is narrow and rocky, and the coast on both sides is well fortified. The design to make it a naval arsenal originated with Richelieu, and was carried out by Duquesne and Vauban in the reign of Louis XIV, with the result that the town was made almost impregnable. Brest stands on the summit and sides of a projecting ridge, many of the streets being exceedingly steep. Several of the docks have been cut in the solid rock, and a breakwater extends far into the roadstead. The manufactures of Brest are inconsiderable, but it has an extensive trade in cereals, wine, brandy, sardines, mackerel, and colonial goods. It is connected with America by a cable terminating near Duxbury, Mass.

**Brest-Litovsk** (brest-lē-tovsk'), a fortified town of Russia, prov. of Grodno, on the Bug. It was captured by the Germans in August, 1915, during the European war, and it was here that the delegates from Russia and the Central powers met to discuss peace terms in 1917 and 1918. The population before the war was about 48,000.

**Brest-summer,** BREAST-SUMMER, or BRESSOMER, in building, a beam or summer placed horizontally to support an upper wall or partition, as the beam over shop windows; a lintel.

**Bretagne** (brė-tàn-yė). See *Brittany.*

**Bretèche,** BRETESCHE (brā-tesh'), a name common to several wooden crenellated, and roofed erections, used in the middle ages in sieges by the assailants to afford protection while they were undermining the walls, and by the besieged to form defenses behind breaches. Later, the name was given to a sort of roofed wooden balcony or cage, crenellated and machicolated, attached by corbels, sometimes immediately over a gateway.

**Bretigny** (brė-tēn-yē), a village of France, dep. Eure-et-Loire. By the treaty of Bretigny (8th of May, 1360), between Edward III of England and John II of France, the latter who had been taken prisoner at Poitiers, recovered his liberty on a ransom of 3,000,000 crowns, while Edward renounced his claim to the crown of France, and relinquished Anjou and Maine, and the greater part of Normandy, in return for Aquitaine, Gascony, Poitou, Saintonge, Périgord, Limousin, etc.

**Breton de Los Herreros** (bre-ton' de los er-er'ōs), DON MANUEL, a popular Spanish poet, born in 1800; died in 1873. He furnished the Spanish stage with more than 150 pieces, original and adapted, besides writing lyrical and satirical poems, etc.

**Bret'ons,** the inhabitants of Brittany.

**Bretts and Scots,** LAWS OF, the name given in the 13th century to a code of laws in use among the Celtic tribes in Scotland, the Scots being the Celts north of the Forth and Clyde, and the Bretts being the remains of the British inhabitants of the kingdom of Cambria, Cumbria, or Strath-

clyde, and Reged. Edward I issued in 1305 an ordinance abolishing the usages of the Scots and Bretts. Only a fragment of them has been preserved.

**Bretwalda** (bret-wâl'da), a title applied to one of the Anglo-Saxon tribe-chiefs or kings, who it is supposed was from time to time chosen by the other chiefs, nobility, and aldermen to be a sort of dictator in their wars with the Britons.

**Breughel** (bre*u'h*el), the name of a celebrated Dutch family of painters, the first of whom adopted this name from a village not far from Breda. This was Pieter Breughel (sixteenth century), also called, from the character and subject of most of his representations, the Droll or the Peasants' Breughel. He left two sons—Pieter and Jan. The former (1565-1625) is commonly known as the Younger Breughel, though he also obtained the name of Hell Breughel, from the many scenes painted by him in which devils and witches appear. His *Orpheus Playing on the Lyre before the Infernal Deities* and *Temptation of St. Anthony* are specially noteworthy in the history of grotesque art. The former picture hangs in the gallery of Florence. The second brother, Jan (1568-1625), known as Velvet Breughel, or Flower Breughel, was distinguished for his landscapes and small figures. He also painted in co-operation with other masters, his *Four Elements* and other pictures being the joint work of Rubens and himself. Later members of his family are Ambrose, director of the Antwerp Academy of Painting between 1635 and 1670; Abraham, who for a time resided in Italy, and died in 1690; the brother of the latter, John Baptist, who died in Rome; and Abraham's son, Caspar Breughel, known as a painter of flowers and fruits.

**Breve** (brēv), in music, a note formerly square, as ; but now of an oval shape, with a line perpendicular to the stave on each of its sides: . For nearly two centuries it was the musical unit of duration, but has since been supplanted by the semibreve, the breve being now of comparatively rare occurrence.

**Brevet** (brev-et'), in the United States and Britain applied to a commission to an officer, entitling him to a rank in the army higher than that which he holds in his regiment, without, however, conferring the right to a corresponding advance of pay.

**Breviary** (brev'i-a-ri), the book which contains prayers or offices to be used at the seven canonical hours of matins, prime, tierce, sext, nones, vespers, and compline by all in the order of the Church of Rome or in the enjoyment of any R. Catholic benefice. It is not known at what time the use of the breviary was first enjoined, but the early offices were exhaustive from their great length, and under Gregory VII (1073-85) their abridgement was considered necessary; hence the original of the breviary (Lat. *brevis*, short). In 1568 Pius V published that which has remained, with few modifications, to the present day. The Roman breviary, however, was never fully accepted by the Gallican Church until after the strenuous efforts made by the Ultramontanes from 1840 to 1864. The Psalms occupy a large place in the breviary; passages from the Old and New Testament and from the fathers have the next place. All the services are in Latin, and their arrangement is very complex. The English Book of Common Prayer is based on the Roman Breviary.

**Brevier** (bre-vēr'), a size of printing type between bourgeois and minion, often used as the body type of reference books; known also as 'eight point.'

**Brevipennatæ** (brev-i-pen-nā'tē), a name sometimes given to a shortwinged division of Natatores, or swimming birds. It includes the penguins, auks, guillemots, divers and grebes.

**Brevipennes** (brev-i-pen'ez), in Cuvier's classification the first family of his order Grallæ, or wading birds, and equivalent to the order Cursores or section Ratitæ of other naturalists. The ostrich, emu, cassowary, dodo, etc., belong to this tribe.

**Brewer** (brū'er), E. Cobham, an English author, born in London in 1810; died 1897. He was graduated at Cambridge in 1835, and took priests' orders in the English church in 1836. His works include *Dictionary of Phrase and Fable*, *Reader's Hand Book*, *Dictionary of Miracles*, *Guide to Science*, *History of France*, *History of Germany*, etc.

**Brewer,** David J., an American legislator, born at Smyrna, Asia Minor, in 1837, graduated at Yale University, studied law, and in 1870 became a justice in the Supreme Court of Kansas. Appointed to the United States Circuit Court in 1884, he was made a justice of the United States Supreme Court in 1889. He was president of the Venezuela boundary commission of 1896 and a member of the Venezuela arbitration tribunal of 1898. He died March 18, 1910.

**Brewer,** Thomas Mayo, ornithologist, born at Boston, Massachusetts, in 1816; died in 1880. He grad-

uated in medicine, became a journalist, and in 1857 a member of a book-publishing firm. He wrote *Oology of North America*, was one of the authors of *History of North American Birds*, and edited Wilson's *Birds of America*.

**Brewing** (brö'ing), the process of extracting a saccharine solution from malted grain and converting the solution into a fermented alcoholic beverage called *ale* or *beer*. The preliminary process of *malting* (often a distinct business to that of brewing) consists in promoting the germination of the grain for the sake of the saccharine matter into which the starch of the seed is thus converted. The barley or other grain is steeped for about two days in a cistern and then piled in a heap, or *couch*, which is turned and re-turned until the radicle or root, and acrospire or rudimentary stem, have uniformly developed to some little extent in all the heap of grain. This treatment lasts from seven to ten days, by which time the grain has acquired a sweet taste; the life of the grain being then destroyed by spreading the whole upon the floor of a kiln to be thoroughly dried. At this point begins the brewing process proper, which in breweries is generally as follows: The malt is crushed or roughly ground in a malt mill, whence it is carried to the mashing machine, and there thoroughly mixed with hot water. The mixture is now received by the mash-tun—a cylindrical vessel with a false perforated bottom held about an inch from the true one. In the mash-tun the useful elements are extracted from the malt in the form of the sweet liquor known as wort, and the tun, therefore, is fitted with an elaborate system of revolving rakes for thoroughly mixing the malt with hot water. The mixing completed, the mash-tun is covered up and allowed to stand for about three hours, when the taps in the true bottom are opened and the wort or malt-extract run off. The wort being drained into a copper, the hops are now added, and the whole boiled for about two hours, the boiling, like the addition of hops, tending to prevent acetous and putrefactive fermentation. When sufficiently boiled the contents of the copper are run into the hop-back—a long, rectangular vessel with a false bottom 8 or 9 inches from the true bottom. The hot wort leaving the spent hops in the hop-back runs through the perforations in the false bottom and thence into the cooler—a large flat vessel where the worts are cooled to about 100° Fah. From the cooler the liquor is admitted to the refrigerator—a shallow rectangular vessel, which reduces the temperature to almost that of the cold water, or about 58°. The worts are next led by pipes into the large wooden fermenting tuns, where yeast or barm is added as soon as the wort begins to run in from the refrigerator. During the operation of fermentation, by which a portion of the saccharine matter is converted into alcohol, the temperature rises considerably, and requires to be kept in check by means of a coil of copper piping with cold water running through it lowered into the beer. When the fermentation has gone far enough, and the liquor has been allowed to settle, the beer becomes comparatively clear and bright, and may be run off and filled into the trade casks or into vats.

The various beers manufactured from grain are generally classified under the three heads of *beer*, *ale*, and *porter*. All beer in its fresh condition is charged with a certain amount of carbonic acid gas, hence is a sparkling and foaming beverage. In some of the western states, especially on the Pacific coast, a kind of beer known as steam beer is manufactured. It is characterized by much life and a prickly, slightly acid taste. *Weiss* beer is a product in a high state of strength after fermentation, and it also possesses much life and a prickly, somewhat sour taste. Ale was originally made from barley malt and yeast alone, and the use of hops was first introduced in Germany, which is still a great brewing country. One of the kinds of German beer now widely known and consumed is *lager beer*—that is, *store* beer, the name being given to it because it is usually kept for four to six months before being used. In brewing it the fermentation is made to go on rather slowly and at a low temperature. Much lager beer is now made in America. Among the most celebrated beers are the English pale ales brewed at Burton-on-Trent. The excellence of the Burton ale depends partly on the water used, which is all drawn from wells, and contains carbonates and sulphates of lime and magnesia in large quantities, and partly on the method of brewing. The English bitter beer made for home consumption is less bitter than that which is sent abroad, at least as brewed by the best brewers; but a good part of the beer sold under this name is of poor quality and would have little flavor were it not for the hops. Porter, which is very largely made in London, as also in Dublin, is of a very dark color, this color being obtained by the use of a certain proportion of malt subjected to a heat sufficient to scorch or blacken it.

The manufacture of ale or beer is of

very high antiquity. Herodotus ascribes the invention of brewing to Isis, and it was certainly practised in Egypt. Xenophon mentions it as being used in Armenia, and the Gauls were early acquainted with it. Pliny mentions an intoxicating liquor made of grain and water as common to all the nations of the west of Europe, and in England ale-booths were regulated by law as early as the 8th century. A rude process of brewing is carried on by many uncivilized races; thus *chica* or maize beer is made by the South America Indians, millet beer by various African tribes, etc.

**Brewster** (brö'ster), BENJAMIN HARRIS, a distinguished lawyer, born in Salem Co., New Jersey, in 1816; died in 1888. He was admitted to the Philadelphia bar in 1838, was attorney-general of Pennsylvania 1867–69, and attorney-general of the United States 1881–85, becoming notable for his prosecution of the Star Route case.

**Brewster,** (FREDERICK CARROLL, an American lawyer, born in Philadelphia, Pa., in 1825; died in 1898. He graduated at the University of Pennsylvania; was admitted to the bar in 1844 and was city solicitor of Philadelphia, 1862 to 1866, when he became judge of the Court of Common Pleas. In 1869 he was made attorney-general of Pennsylvania. He was instrumental in obtaining for the city of Philadelphia the Stephen Girard bequest.

**Brewster,** SIR DAVID, scientist, born at Jedburgh, Scotland, in 1781; studied at Edinburgh University for the church, but was attracted by the lectures of Robinson and Playfair to science. In 1807 he was an unsuccessful candidate for the mathematical chair at St. Andrews, but became in the same year M.A. of Cambridge, LL. D. of Aberdeen, and member of the Royal Society of Edinburgh, to the *Transactions* of which he contributed important papers on the polarization of light. In 1832 he was knighted and pensioned, and both before and after this time his services to science obtained throughout Europe the most honorable recognition. Among his inventions were the 'polyzonal lens' (introduced into British lighthouses in 1835), the kaleidoscope, and the improved stereoscope. His chief works are a *Treatise on the Kaleidoscope* (1829); *Letters on Natural Magic* (1831); *Treatise on Optics* (1831); *More Worlds than One* (1854); and Lives of Euler, Newton, Galileo, Tycho Brahe, and Kepler. He died in February, 1868.

**Brialmont** (brē-ȧl-mōn), HENRI ALEXIS, a Belgian military writer, born in 1821, entered the army in 1843 as lieutenant of engineers, became lieutenant-general. Among his works are *Considérations Politiques et Militaires sur la Belgique; Précis d'Art Militaire; Histoire du Duc de Wellington*, translated into English by Gleig; *Étude sur la Défense des États et sur la Fortification;* and many works on fortification. He died in 1903.

**Brian** (brī'an; surnamed *Boroimhé* or *Boru*), a famous chieftain of the early Irish annals, who succeeded to Munster in 978, defeated the Danes of Limerick and Waterford, attacked Malachi, nominal king of the whole island, and became king in his stead (1002). He was slain at the close of the battle of Clontarf, near Dublin, in 1014, after gaining a signal victory over the revolted Maelmora and his Danish allies.

**Briançon** (brē-ȧn-sōn; ancient *Brigentium*), a town and fortress of France, department of Hautes Alpes, on the right bank of the Durance. It occupies an eminence 4284 ft. above sea-level, and has been called the Gibraltar of the Alps. Pop. 7524.

**Briand** (brē-and'), a French lawyer and journalist, born at Nantes in 1863, became a leading Socialist, and in 1902 was elected to the Chamber of Deputies. In 1905 he was made Minister of Instruction and Worship, later Minister of Justice, and Prime Minister in 1909, and settled the great railroad strike of 1910 by calling the men to the colors. He again became Premier in 1913 and in 1915.

**Briareus** (brī-ā're-us), in Greek fable, a giant with 100 arms and 50 heads, aided Jupiter (Zeus) in the war with the Titans.

**Bribe** (brīb), a reward given to a public officer or functionary to induce him to violate his official duty so as to aid the purpose of the person bribing; especially a corrupt payment of money for the votes of electors in the choice of persons to places of trust under government. Bribery is in most countries regarded as a crime deserving severe punishment. In Britain acts amending and consolidating previous acts against bribery at elections were passed in 1854 and in 1868, when it was enacted that election petitions should be tried by a specially constituted court. There have been flagrant instances of bribery within recent years in the United States, and stringent preventive enactments have been passed, though such laws are rarely effective on account of the secrecy of the proceeding

and the difficulty of obtaining satisfactory evidence.

**Brick,** a sort of artificial stone, made principally of argillaceous earth formed in molds, dried in the sun, and baked by burning, or, as in many Eastern countries, by exposure to the sun. Sun-dried bricks of great antiquity have been found in Egypt, Assyria, and Babylonia, and in the mud walls of old Indian towns, and are now much used in Mexico and others of the Latin American countries. Under the Romans the art of making and building with bricks was brought to great perfection, and the impressions on Roman bricks, like those on the bricks of Babylonia, have been of considerable historic value. The Roman brick was afterwards superseded in England by the smaller Flemish make. Of the various clays used in brickmaking, the simplest, consisting chiefly of silicates of alumina, are almost infusible, and are known as fire-clays, the Stourbridge clay being specially famous. Of such clays fire-bricks are made. Clays containing lime and no iron burn white, the colors of others being due to the presence in varying proportions of ferric oxide, which also adds to the hardness of bricks. The clay should be dug in autumn and exposed to the influence of frost and rain. It should be worked over repeatedly with the spade and tempered to a ductile, homogeneous paste, and should not be made into bricks until the ensuing spring. The making of bricks by hand in molds is a simple process. After being made and dried for about nine or ten days they are ready for the burning, for which purpose they are formed into *kilns*, having flues or cavities at the bottom for the insertion of the fuel, and interstices between them for the fire and hot air to penetrate. Much care is necessary in regulating the fire, since too much heat vitrifies the bricks and too little leaves them soft and friable. Bricks are now largely made by machines of various construction. In one the clay is mixed and comminuted in a cylindrical pug-mill by means of rotatory knives or cutters working spirally and pressing the clay down to the bottom of the cylinder. From this it is conveyed by rollers and forced through an opening of the required size in a solid rectangular stream, which is cut into bricks by wires working transversely. Machine-made bricks are heavier, being less porous than hand-made bricks, and are more liable to crack in drying; but they are smoother, and, when carefully dried, stronger than the hand-made ones.

**Bridewell** (brid'wel), in Blackfriars, London, formerly used as a house of correction. The building, of which only the hall, treasurer's house, and offices remain, takes its name from a well once existing between Fleet Street and the Thames, and dedicated to St. Bride. Henry VIII built on this site, in 1522, a palace for the accommodation of the Emperor Charles V, which was afterwards converted by Edward VI into a hospital to serve as a workhouse for the poor and as a house of correction.

**Bridge** (brij'), a structure of stone, brick, wood, or iron, affording a passage over a stream, valley, or the like. The earliest bridges were no doubt trunks of trees, followed by suspension bridges made of tough, fibrous plants. The arch seems to have been unknown among most of the nations of antiquity. Even the Greeks had not sufficient acquaintance with it to apply it to bridge building. The Romans were the first to employ the principle of the arch in this direction, and after the construction of such a work as the great arched sewer at Rome, the *Cloaca Maxima*, a bridge over the Tiber would be of comparatively easy execution. One of the finest examples of the Roman bridge was the bridge built by Augustus over the Nera at Narni, the vestiges of which still remain. It consisted of four arches, the longest of 142 feet span. The most celebrated bridges of ancient Rome were not generally, however, distinguished by the extraordinary size of their arches, nor by the lightness of their piers, but by their excellence and durability. The span of their arches seldom exceeded 70 or 80 feet, and they were mostly semicircular, or nearly so. The Romans built bridges wherever their conquests extended, and in Britain there are still a number of bridges dating from Roman times. One of the most ancient post-Roman bridges in England is the Gothic triangular bridge at Croyland, in Lincolnshire, said to have been built in 860, having three archways meeting in a common center at their apex, and three roadways. The longest old bridge in England was that over the Trent at Burton, in Staffordshire, built in the twelfth century, of squared freestone, and recently pulled down. It consisted of thirty-six arches, and was 1545 feet long. Old London Bridge was commenced in 1176, and finished in 1209. It had houses on each side like a regular street till 1756–58. In 1831 it was altogether removed, the new bridge, which had been begun in 1824, having then been finished. The art of bridge-building made no progress after the destruction of the Roman empire till the eighteenth century, when the French architects began to in-

troduce improvements, and the constructions of Perronet (Nogent-sur-Seine; Neuilly; Louis XVI bridge at Paris) are masterpieces. Within the last half century or so the use of steel and iron, the immense development of all mechanical contrivances, and the great demand for railway bridges and viaducts have given a great stimulus to invention in this department.

Stone bridges consist of an arch or series of arches, and in building them the properties of the arch, the nature of the materials, and many other matters have to be carefully considered. It has been found that in the construction of an arch the slipping of the stones upon one another is prevented by their mutual pressure and the friction of their surfaces; the use of cement is thus subordinate to the principle of construction in contributing to the strength and maintenance of the fabric. The masonry or rock which receives the lateral thrust of an arch is called the *abutment*, the perpendicular supports are the *piers*. The width of an arch is its *span:* the greatest span in any stone bridge is about 250 feet. A one-span bridge has, of course, no piers. In constructing a bridge across a deep stream it is desirable to have the smallest possible number of points of support. Piers in the waterway are not only expensive to form, but obstruct the navigation of the river, and by the very extent of resisting surface they expose the structure to shocks and the wearing action of the water. In building an arch, a timber framework is used called the *center* or *centering*. The *centering* has to keep the stones or *voussoirs* in position till they are keyed in, that is, all fixed in their places by the insertion of the keystone.

The first iron bridges were erected from about 1777 to 1790. The same general principles apply to the construction of iron as of stone bridges, but the greater cohesion and adaptability of the material give more liberty to the architect, and much greater width of span is possible. At first iron bridges were erected in the form of arches, and the material employed was cast-iron; but the arch has now been generally superseded by the beam or *girder*, with its numerous modifications; and wrought-iron or steel is likewise found to be much better adapted for resisting a great tensile strain than cast-metal. Numerous modifications exist of the beam or girder, as the *lattice-girder*, *bowstring-girder*, etc.; but of these none is more interesting than the *tubular* or hollow girder, first rendered famous from its employment by Robert Stephenson in the construction of the railway bridge across the Menai Strait, and connecting Anglesey with the mainland of North Wales. This is known as the Britannia Tubular Bridge. The tubes are of a rectangular form, and constructed of riveted plates of wrought-iron, with rows of rectangular tubes or cells for the floor and roof respectively. The bridge consists of two of these enormous tubes or hollow beams laid side by side, one for the up and the other for the down traffic of the railway, and extending each about a quarter of a mile in length. Other tubular bridges of importance are the Conway Bridge, over the river Conway, an erection identical in principle with the Britannia Bridge, but on a smaller scale; the Brotherton Bridge over the river Aire; the tubular railway bridge across the Damietta branch of the Nile, which has this peculiarity, that the roadway is carried *above* instead of *through* the tubes; and the Victoria Bridge over the St. Lawrence, Canada. In many respects this structure is even more remarkable than the Britannia Bridge, being supported by twenty-four piers, and nearly 2 miles in length, or about five and a half times that of the bridge across the Menai Strait. A girder railway bridge across the Firth of Tay at Dundee was opened in 1887, being the second built at the same place, after the first had given way in a great storm. It is 2 miles 73 yds. long, has 85 spans, is 77 ft. high, and carries two lines of rails.

Suspension-bridges, being entirely independent of central supports, do not interfere with the river, and may be erected where it is impracticable to build bridges of any other kind. The entire weight of a suspension-bridge rests upon the piers at either end from which it is suspended, all the weight being below the points of support. Such bridges always swing a little, giving a vibratory movement which imparts a peculiar sensation to the passenger. The modes of constructing these bridges are various. The roadway is suspended either from chains or from wire-ropes, the ends of which require to be *anchored;* that is, attached to the solid rock or masses of masonry or iron. The most notable examples are the great cantilever bridge over the St. Lawrence at Quebec, 1800 feet in length, and the Forth bridge in Scotland, the three cantilevers of which measure a mile in length. A new material for bridge building is concrete, now taking the place of stone and iron in arch bridges. Among notable examples of this type may be named that over the Wissahickon ravine in Philadelphia. The Cincinnati bridge over the Ohio has a span of 1057 feet. A suspen-

*Photograph from Underwood & Underwood*

**THE GIGANTIC CANTILEVER BRIDGE WHICH SPANS THE ST. LAWRENCE RIVER AT QUEBEC**

The great center span, 640 feet long and weighing 5,600 tons, is being hoisted into place to complete the structure. It was a similar span which fell in 1916, carrying 90 men to death. The completed bridge is the largest of its type in the world. It cost $16,876,000, is 3,239 feet long, 88 feet wide and 163 feet high from the base of rail to high water level. It carries two railroad tracks, a driveway for vehicles and two concrete foot paths.

sion-bridge of great magnitude, connecting the city of New York with Brooklyn, was opened in 1883. The central or main span is 1595½ feet from tower to tower, and the land spans between the towers and the anchorages 930 feet each; the approach on the New York side is 2492 feet long, and that on the Brooklyn side 1901 feet, making the total length 5989 feet. Since its completion three other great bridges across the East River have been constructed, the Manhattan bridge, total length of roadway 6855 feet, width of bridge 122 ft. 6 in.; cost $26,000,000; the Williamsburg Bridge, 7308 feet long, 118 ft. wide, and on October 1, 1915, the steel arms of the bridge spanning Hell Gate, on the East River, New York City, were locked and the largest self-supporting arch in the world, under erection since the beginning of the year, was completed. The bridge forms a link in the chain of construction connecting the Pennsylvania and the New York, New Haven and Hartford systems. The span of the bridge is 1016 feet, 10 inches. The entire weight of the loaded bridge is 38,000 tons. The load carried per lineal foot is twelve tons, while the dead weight per lineal foot is twenty-six tons. The bridge was designed and constructed under the charge of Gustav Lindenthal, at a cost of $12,000,000.

The Cantilever Bridge is built on the principle of the bracket, or fixed base of support on which the structure is sustained. Of this type of bridge a notable example is that which crosses the Firth of Forth in Scotland, it being one of the largest bridges in the world. Its total length, including piers, is 8296 feet, or a little over 1½ miles, while its two main spans are each 1700 feet in length. Another splendid example of this type is the great railroad bridge over the St. Lawrence River at Quebec, notable for the disasters attending its erection. A large part of the structure fell in 1907, causing considerable loss of life. In 1916 the connecting span, while being lifted into place, slipped and fell to the river bottom. In 1917 a new span was successfully lifted into place and the construction of the magnificent structure thus assured.

Some of the most striking developments in the art of bridge building belong to the United States, where an enormous railroad system, traversing a country of great rivers and ravines, has given an active impetus to the art. The main characteristics of American bridges are simplicity and boldness of design and the reduction of the number of members by the use of open trusses composed of simple systems, thus reducing the resistance to wind pressure below that usual in European bridges. Within recent years, concrete has come into considerable use in building arched bridges for cities and important country roads, a splendid example being the arched bridge over the Wissahickon Valley, in Philadelphia. Railroad bridges also are often built of concrete, among them being the famous Tunkhannock viaduct in Northeastern Pennsylvania.

**Bridge,** a game of cards for four persons, differing from whist (*q. v.*) (1) in that no trump is turned, the dealer naming the trump after examining his cards, or leaving it to his partner to declare; and (2) particularly because only three players actually engage in playing the hand, the cards of the dealer's partner being exposed as a dummy hand and played by the dealer in conjunction with his own. The scoring also differs from that in whist; each trick in excess of six counts, with spades as trumps, 2 points; with clubs, 4; with diamonds, 6; with hearts, 8; with "no trumps," 12. These values may be increased by "doubling" and "redoubling." A game consists of 30 points, not counting honor scores, which vary in value with the trump declaration and the relative distribution of the honor cards between the two partners who hold a preponderance of honors. A grand slam (taking all 13 tricks in a hand) also counts 40, and a little slam 20, in honors. A rubber consists of 3 games, the partners winning 2 of the 3, adding 100 points to their honor score. The honor score is not affected by doubling or redoubling, which applies to the trick score only.

**Bridgeman** (brij'man), LAURA, a blind deaf-mute, born in Hanover, N. H., in 1829; died in 1889. When two years of age a severe illness deprived her of the senses of sight, hearing, and smell. She was put under the care of Dr. Howe, of Boston, and the history of the methods by which she was gradually taught to read, write, and eventually perform most of the ordinary duties and even some of the accomplishments of life, is a very interesting one.

**Bridge'north,** or BRIDGNORTH, a town of Shropshire, England, 19 miles S. E. from Shrewsbury, on the Severn. Pop. (1911) 5768.

**Bridgeport** (brij'port), a city, one of the capitals of Fairfield Co., Connecticut, 58 miles N. E. of New York, on an arm of Long Island Sound, with a large coasting trade, but chiefly supported by its manufactures. These include the large sewing-machine factories of Wheeler & Wilson Co. and Elias Howe, large cartridge, ordnance, and graphophone works, etc. It has a considerable coasting trade. Pop. 102,054.

**Bridges,** ROBERT, poet laureate of England, born October 23, 1844; educated at Eton and at Oxford; then studied medicine at St. Bartholomew's, London. He is the author of various essays, plays and poems.

**Bridget** (brij'et), the name of two saints in the Roman Catholic Church.—The first, better known as ST. BRIDE, was born in Ireland about the end of the fifth century. She was exceedingly beautiful, and to avoid offers of marriage and other temptations implored God to render her ugly, which prayer was granted. An order of nuns of St. Bride was established, which continued to flourish for centuries. St. Bride was held in great reverence in Scotland.—The second ST. BRIDGET, or more properly Birgit or Brigitte, was the daughter of a Swedish prince, born about 1302, and died at Rome in 1373, on her return from a pilgrimage to Palestine. She left a series of mystic writings which were pronounced inspired by Gregory XI and Urban VI. Her youngest daughter, Catherine, was also canonized, and became the patron saint of Sweden.

**Bridgeton** (brij'ton), a city and port of entry in New Jersey, situated on both sides of Cohansey Creek, 38 miles S. of Philadelphia. It is the trade center of a large agricultural region, fruit-canning being a large industry; has also wire, nail, and glass works, etc. Pop. 14,209.

**Bridgetown** (brij'toun), the capital of the island of Barbados, in the West Indies, extending along the shore of Carlisle Bay, on the S.W. coast of the island, for nearly 2 miles. Its appearance is very pleasing, the houses being embosomed in trees, while hills of moderate height rise behind, studded with villas. Bridgetown is the residence of the governor-general of the Windward Islands. Pop. about 22,000.

**Bridgewater** (brij'wą-tẽr), or BRIDGWATER, a municipal borough and port in the county of Somerset, England, on the Parret, which is navigable as far up as the town for small vessels. A considerable shipping trade is carried on, chiefly coastwise. Bricks are made here in great quantities, especially bath bricks. Pop. (1911) 16,802.

**Bridgewater,** Plymouth Co., Massachusetts, 27 miles S. of Boston. It is an important educational town, and has large foundries and machine shops and other industries. Pop. 9000.

**Bridgewater,** FRANCIS EGERTON, DUKE OF, an English nobleman, born in 1736. His estate of Worsley contained valuable coal mines, and with the view of establishing a communication between these and the town of Manchester, at 7 miles distance, he employed Brindley to construct a navigable canal, which, after having encountered much opposition and ridicule, was triumphantly carried through. He was the chief promoter of other excellent works of the same kind. He died in 1803. See *Brindley*.

**Bridgewater Treatises,** a series of books, the outcome of the will of the Rev. Henry Francis, Earl of Bridgewater, who died in 1829, bequeathing a sum of £8000, which should be paid to the person or persons chosen to write and publish 1000 copies of a work on the power, wisdom, and goodness of God as manifested in the creation. The result was eight works on animal and vegetable physiology, astronomy, geology, the history, habits, and instincts of animals, etc., which at one time enjoyed great popularity. The names of the writers are Dr. Chalmers, Dr. Kidd, Dr. Whewell, Sir Charles Bell, Dr. Roget, Dr. Buckland, Rev. William Kirby, and Dr. Prout.

**Bridle** (brī'dl), the headstall, bit, and reins by which a horse is governed.

**Brid'lington** (usually pronounced and often written Burlington), a town of Yorkshire, England, agreeably situated about a mile from the sea, 37 miles N.E. from York, with a considerable trade. Pop. 14,334. Half a mile from Bridlington is *Bridlington Quay*, a favorite sea-bathing resort, and having also mineral waters resembling those of Scarborough and Cheltenham.

**Brid'port,** a seaport in Dorsetshire, England, between the rivers Bride or Brit and Asker, which unite a little below the town, and form a safe and commodious harbor for small vessels. There are manufactures of shoe-thread, twine, lines, sail-cloth, fishing-nets, etc. Pop. 5919.

**Brief** (brēf), which comes from the Latin *brevis*, short, denotes a brief or short statement or summary, particularly the summary of a client's case which the solicitor draws up for the instruction of counsel. A brief may also mean, in law, an order emanating from the superior courts. A *papal brief* is a sort of pastoral letter in which the pope gives his decision on some matter which concerns the party to whom it is addressed. The brief is an official document, but of a less public character than the bull.

**Brieg** (brēh), a town of Prussia, province of Silesia, on the left bank of the Oder, which is here crossed by a long traffic bridge, 26 miles S. E. from Breslau, with a considerable transit trade and some manufactures, chiefly linens, woolens, cottons, leather, etc. Pop. 24,114.

**Briel** (brēl), or BRIELLE (brē-el'), sometimes called the *Brill*, a fortified seaport of Holland, near the mouth of the Maas, province of South Holland. The taking of Briel in 1572 was the first success of the revolted Netherlanders in their struggle with Philip II of Spain. The famous Admiral Van Tromp was born here. Pop. 4107.

**Brienne** (brē-ăn), a small town of France, dep. Aube. In the military academy which formerly existed here Napoleon received his early military training. Brienne was also the scene of a bloody battle between Blücher and Napoleon (29th Feb. 1814). Pop. about 1700.

**Brienne,** JOHN OF, a celebrated Crusader, born in 1148; died in 1237; was son of Erard II, Count of Brienne; was present at the siege of Constantinople in 1204, and afterwards, in 1209, married the granddaughter and heiress of Amaury, King of Jerusalem. Brienne thus obtained an empty title which he afterwards ceded to the Emperor Frederick II. Later on he was again formally associated with Baldwin II as joint emperor of the Latin empire in the East. After a series of heroic exploits in defense of his dominions, in 1237 he resigned his crown to retire into a monastery, where he died.

**Brierly Hill** (brī'er-ly), a town in Staffordshire, England, on the Stour. It lies in a rich mineral district, and carries on considerable industry. Pop. (1911) 12,264.

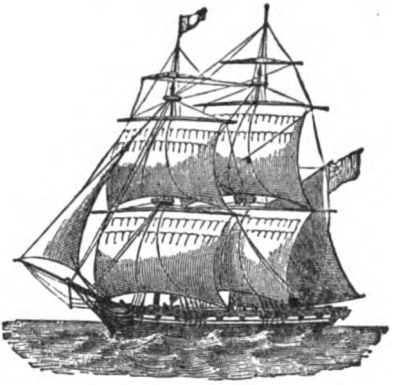
**Brieuc,** St. (saṇ brē-*eu*), a seaport town of France, dep. Côtes du Nord, about a mile above the mouth of the Gouët. It is the seat of a bishop and has a very ancient cathedral. It manufactures cottons, woolen stuffs, paper, etc. Pop. 14,629.

**Brieux** (brē-*eu*), EUGÈNE, a French dramatist, born at Paris, 1858. He has produced many plays, chiefly sociological. His *Les Avariés*, portraying the horrible consequences of the sowing of 'wild oats,' has gained wide popularity in America under the title of *Damaged Goods*.

**Brig,** a sailing vessel with two masts rigged like the foremast and mizzen-mast of a full-rigged ship.

**Brigade** (bri-gād). In the United States army three regiments of infantry or cavalry usually constitute a brigade, commanded by a brigadier-general. A number of brigades form a division; several divisions an army corps. In most European armies an infantry brigade consists of two regiments, each of three battalions.

**Briggs** (brigs), CHARLES A., clergyman, born in New York in 1841; professor of Hebrew in Union Theological Seminary, New York, in 1874; of Biblical Theology, 1890. He was accused of heresy from statements in his inaugural address, tried and suspended from the Presbyterian ministry until he should retract. In 1898 he was ordained priest by the P. E. bishop of New York. Author of many books. He died in 1913.



Brig.

**Bright** (brīt), JOHN, a great English orator and politician, born at Greenbank, near Rochdale, Lancashire, Nov. 16, 1811. His father, Mr. Jacob Bright, carried on a cotton-spinning and manufacturing business of which the son became the head. He first became known as a leading spirit along with Mr. Cobden in the Anti-Corn-Law League. In 1843 he was chosen M. P. for Durham, and distinguished himself as a strenuous advocate of free trade and reform. In 1847 he sat for the first time for Manchester, but in 1857 his opposition to the war with China made him so unpopular in the constituency that he lost his seat by a large majority. He was, however, returned for Birmingham, and soon after made speeches against the policy of great military establishments and wars of annexation. In 1865 he took a leading part in the movement for the extension of the franchise, and strongly advocated the necessity of reform in Ireland. In the

Gladstone ministry formed in 1868 he was President of the Board of Trade and afterwards Chancellor of the Duchy of Lancaster, and he held the latter office again under Mr. Gladstone in 1880–82. In 1886 he joined the Liberals who opposed Mr. Gladstone's schemes for Ireland, and contributed by his letters and influence to the overthrow of the Gladstone party. He was a member of the Society of Friends. He died March 27, 1889.

John Bright.

**Brighton** (brī'tun; formerly *Brighthelmstone*); a maritime town and favorite watering-place in England, county of Sussex, 50 miles from London. It is situated on a gentle slope, protected from the north winds by the high ground of the south downs immediately behind the town, and is well built, with handsome streets, terraces, squares, etc. In front of the town is a massive sea-wall, with a promenade and drive over 3 miles in length, one of the finest in Europe. Among the remarkable buildings, all of modern date, is the Pavilion, built by George IV, which cost upwards of $5,000,000. It is in the oriental style, with numerous cupolas, spires, etc. The building and its gardens, which are open to the public as pleasure-grounds, cover about 9 acres. There is a very large and complete aquarium, and a fine iron pier. Brighton has no manufactures, and is resorted to only as a watering-place. It was about the middle of the 18th century that Dr. Russell, an eminent physician, drew attention to Brighton, which subsequently was patronized by George IV, then Prince of Wales; in this way it was converted from a decayed fishing village into a fashionable and populous watering-place. The pop. in 1801 was only 7339; now it is 131,250.

**Bright's Disease,** a name (derived from a Dr. Bright of London, who first described the disorder) given to various forms of kidney disease, especially to that which is characterized by a granular condition of the cortical part of the kidneys and inflammation of the Malpighian bodies. The urine during life contains albumen, and is of less specific gravity than natural. The disease is accompanied with uneasiness or pain in the loins, pale or cachectic countenance, disordered digestion, frequent urination, and dropsy. The blood contains urea, and is deficient in albumen and corpuscles. Progressive blood-poisoning induces other visceral diseases, and in the end gives rise to the cerebral disturbance which is the frequent cause of death.

**Brignoles** (brin-yōl), a town in Southern France, dep. Var, in a fertile valley celebrated for its salubrity. Pop. 3639.

**Brihuega** (brē-wā'gä), a town of Spain, in New Castile, on the Tajuna. Here in 1710 the allies under Lord Stanhope were defeated by the Duke of Vendôme in the Spanish Succession war. Pop. about 3500.

**Bril** (brēl), the name of two brothers who distinguished themselves as landscape-painters.—Matthew, born at Antwerp in 1550; died in 1584; repaired when a very young man to Rome, and was employed on the galleries and saloons of the Vatican.—Paul, born about 1556; died about 1626; was of much superior talent, joined his brother in Rome, and amongst other labors executed a large fresco (his greatest work, 68 feet long) in the Sala Clementina of the Vatican. Paul is memorable as having done much to develop landscape-painting as an independent branch of the art. His best pictures do not fall much short of those of Claude Lorraine, his great successor.

**Brill** (bril; *Rhombus vulgāris*), a fish resembling the turbot, but inferior in quality, and distinguished from it by its inferior breadth and by the perfect smoothness of its skin. The brill is of a pale-brown color above, marked by scattered yellowish or reddish spots. It is abundant in the English Channel, and is esteemed for the table.

**Brillat-Savarin** (brē-yä-sä-vä-ran), a French author, who, although he wrote works on political economy, archæology, and dueling, is now known only by his famous book on gastronomy, the *Physiologie du Goût*, published in 1825. He was born at

Bellay in 1755, and after holding several honorable positions as a magistrate, died at Paris in 1826.

**Brilliant** (bril'yant). See *Diamond.*

**Brimstone** (brim'stōn), a name often given to sulphur. Sulphur, in order to purify it from foreign matters, is generally melted in a close vessel, allowed to settle, then poured into cylindrical molds, in which it becomes hard, and is known in commerce as *roll brimstone* or *roll sulphur.*

**Brindaban** (brin-dă-ban'), a town of India, N. W. Provinces, Muttra District, right bank of the Jumna, one of the holiest cities of the Hindus, with a large number of temples, shrines, and sacred sites. Pop. 22,217.

**Brindisi** (brin'de-zē; anc. *Brundusium*), a seaport and fortified town, province of Lecce, Southern Italy, on the Adriatic, 45 miles E. N. E. of Taranto. In ancient times Brundusium was an important city, and with its excellent port became a considerable naval station of the Romans. Its importance as a seaport declined in the middle ages, and was subsequently completely lost, and its harbor blocked, until in 1870 the Peninsular and Oriental Steam Navigation Company put on a weekly line of steamers between Brindisi and Alexandria for the conveyance of mails and passengers between Europe and the East. From this cause Brindisi has suddenly risen into importance. Pop. 25,317.

**Brindley** (brind'li), JAMES, an English engineer and mechanic, born in 1716; died in 1772. When the Duke of Bridgewater was occupied in planning a communication between his estate at Worsley and the towns of Manchester and Liverpool by water, Brindley undertook the work, and by means of aqueducts over valleys, rivers, etc., he completed the Bridgewater Canal between 1758 and 1761, so as to form a junction with the Mersey. The other great works of this kind undertaken by him were the Grand Trunk Canal uniting the Trent and Mersey, and a canal uniting that with the Severn.

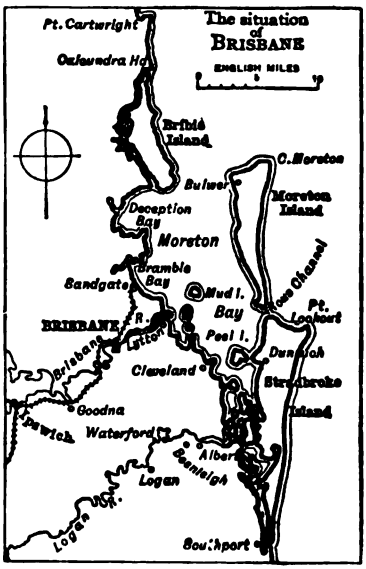
**Brine** (brīn), water saturated with common salt. It is naturally produced in many places beneath the surface of the earth, and is also made artificially, for preserving meat, a little saltpeter being generally added to the solution.

**Brine-shrimp,** a branchiopodous crustacean, the *Artemia salina*, about ½ inch in length, and commonly found in the brine of salt pans previous to boiling.

**Brinton** (brin'ton), DANIEL GARRISON, ethnologist, was born in Chester Co., Pennsylvania, in 1837. After serving as surgeon in the Civil war, he settled in Philadelphia and devoted himself to American archæology and general ethnology, on which he has left a number of valuable works. Died July 31, 1899.

**Brinvilliers** (braṇ-vēl-yā), MARIE MARGUERITE D'DUBRAY, MARCHIONESS OF, born about 1630; executed in 1676. She was married in 1651 to the Marquis of Brinvilliers, but after some seven or eight years of married life a young cavalry officer named Sainte-Croix inspired her with a violent passion, and being instructed by him in the art of preparing poisons, she poisoned in succession her father, her two brothers, and her sisters, chiefly, it is thought, in order to procure the means for living extravagantly with her paramour. The sudden death of Sainte-Croix, caused, it is said, by the falling off of a glass mask which he used to protect himself in preparing poisons, led to the discovery of letters incriminating Madame de Brinvilliers. She fled to England, and finally to Liége, where she was captured, conveyed to Paris, and condemned to death.

**Brisbane** (bris'bān), the capital of Queensland, Australia, about 25 miles by water from the mouth




of the river Brisbane, which intersects the town. Brisbane was originally settled, in

1825, as a penal station by Sir Thomas Brisbane (whence the name of the town). In 1842 the district was opened to free settlers, and on the erection of Queensland into a separate colony in 1859 Brisbane became the capital. Since then it has made great progress, and now possesses many fine public buildings. There are also botanical gardens, several public parks, etc. The climate is tropical, the annual rainfall about 55 inches. The town is the terminus of the western and southern railway system, and the port is the principal one in the colony. The chief exports are hides, wool and cotton. Population (1911) 140,374.

**Brisbane** (bris'bān), General Sir Thomas MacDougall, a Scotch soldier and astronomer, born in 1773. After serving in Flanders and the West Indies he commanded a brigade under the Duke of Wellington during the Peninsular war, and took part in the battles of Vittoria, Orthes, and Toulouse. In 1821 he was appointed governor of New South Wales, where his administration tended greatly to promote the prosperity of the colony. At the same time he devoted himself to astronomy, and from his observatory at Paramatta catalogued 7385 stars until then scarcely known. He died in Scotland in 1860.

**Brisson** (brē-sōn'), Eugene Henri a French statesman, born at Bourges, July 31, 1835; died in Paris, April 14, 1912. He held a number of important offices, and even when not in office he was conspicuous in public affairs. He took a prominent part in exposing the Panama scandals and acted with firmness and honesty during the Dreyfus affair in 1898.

**Brissot** (brē-sō'), Jean Pierre (also called Brissot de Warville), a French political writer, born in 1754, executed October 30, 1793. He early turned his attention to public affairs, associating himself with such men as Pétion, Robespierre, Marat, etc. In 1780 he published his *Théories des Lois Criminelles*, and two years afterwards an important collection called the *Bibliothèque des Lois Criminelles*. During the revolution he made himself known as a politician and one of the leaders of the Girondist party. When the extreme views of the men of the 'Mountain' prevailed over more moderate counsels, Brissot suffered death by the guillotine.

**Bristles** (bris'ls), the stiff, coarse glossy hairs of the hog and the wild boar, especially of the hair growing on the back; extensively used by brushmakers, shoemakers, sadlers, etc., and chiefly imported from Russia and Germany. Russia supplies the finest qualities, which are worth about $250 or $300 per cwt.

**Bristol** (bris'tol), a cathedral city of England, situated partly in Gloucestershire, partly in Somersetshire, but forming a county in itself. It stands at the confluence of the rivers Avon and Frome, which unite within the city, whence the combined stream (the Avon) pursues a course of nearly 7 miles to the Bristol Channel. The Avon is a navigable river, and the tides rise in it to a great height. The town is built partly on low grounds, partly on eminences, and has some fine suburban districts, such as Clifton, on the opposite side of the Avon and connected with Bristol by a suspension-bridge 703 feet long and 245 feet above high-water mark. The public buildings are numerous and handsome, and the number of places of worship very great. The most notable of these are the cathedral, founded in 1142, exhibiting various styles of architecture, and recently restored and enlarged; St. Mary Redcliff, said to have been founded in 1293, and perhaps the finest parish church in the kingdom. Among modern buildings are the exchange, the guildhall, the council-house, the post-office, the new grammar-school, the fine arts academy, the West of England and other banks, insurance offices, etc. The charities are exceedingly numerous, the most important being Ashley Down Orphanage, for the orphans of Protestant parents, founded and still managed by the Rev. George Müller, which may almost be described as a village of orphans. Among the educational institutions are the University College, the Theological Colleges of the Baptists and Independents, Clifton College, and the Philosophical Institute. There is a school of art, and also a public library. Bristol has glassworks, potteries, soapworks, tanneries, sugar-refineries, and chemical works, shipbuilding and machinery yards. Coal is worked extensively within the limits of the borough. The export and import trade is large and varied, it being one of the leading English ports in the foreign trade. Regular navigation across the Atlantic was first established here, and the *Great Western*, the pioneer steamship in this route, was built here. There is a harbor in the city itself, and the construction of new docks at Avonmouth and Portishead has given a fresh impetus to the port. The construction of very large new docks was begun in 1902. Bristol is one of the healthiest of the large towns of the kingdom. It has an excellent water supply chiefly obtained from the Mendip Hills.—

In old Celtic chronicles we find the name *Caer Oder*, or 'the City of the Chasm,' given to a place in this neighborhood, a name peculiarly appropriate to the situation of Bristol, or rather of its suburb Clifton. The Saxons called it *Bricgstow*, 'bridge-place.' In 1373 it was constituted a county of itself by Edward III. It was made the seat of a bishopric by Henry VIII in 1542 (now united with Gloucester). In 1831 the Reform agitation gave origin to riots that lasted for several days. The rioters destroyed a number of public and private buildings, and had to be dispersed by the military. Sebastian Cabot, Chatterton, and Southey were natives of Bristol. Pop. (1911) 357,059.

**Bristol,** a city of Hartford Co., Connecticut, 17 miles W. S. W. of Hartford. It has foundries and machine shops, clock, tableware, brass goods, and other factories. Pop. 13,502.

**Bristol,** a borough of Bucks Co., Pennsylvania, on the Delaware River, 23 miles N. of Philadelphia; has a foundry, rolling and worsted mills and large manufactures of patent leather, wallpaper, carpets, etc. Pop. 9256.

**Bristol,** a port of entry and capital of Bristol Co., Rhode Island, 15 miles S. S. E. of Providence, and separated from Fall River by Mount Hope Bay. Has shipyards, cotton and woolen mills, etc. Pop. 8565.

**Bristol,** a town of Sullivan Co., Tennessee, on the boundary between that state and Virginia. It is a railroad center and the gateway to extensive coal mining, mineral and timber operations. Here are King College, Sullins College and Virginia Intermont College. The industries embrace iron, furniture, paper, hubs, spokes, clothing, etc. Pop. 7148; including the Virginia section of the town, 13,395.

**Bristol Channel,** an arm of the Atlantic, extending between the southern shores of Wales and the southwestern peninsula of England, and forming the continuation of the estuary of the Severn.

**Bristol-stone,** rock-crystal, or Bristol-diamond, small, round crystals of quartz, found in the Clifton limestone, near Bristol, England.

**Britain** (brit'n), or GREAT BRITAIN, names given to a European island consisting of the former three kingdoms, England, Scotland, and Wales, the name being also used as equivalent to the British Islands collectively. Great Britain and Ireland, with their connected islands, form the United Kingdom of Great Britain and Ireland, the distance between these two islands varying from about 12 to 130 miles. Great Britain is the largest island in Europe, and the seventh largest in the world. Its nearest approach to the continent of Europe is at its S. E. extremity, where the Strait of Dover, separating it from France, is only 21 miles broad. Its length, measured on a line bearing N. by W. from Rye to Dunnet Head, is 608 miles. The breadth varies exceedingly; between St. David's Head, in Pembrokeshire, and the Naze, in Essex, it is 280 miles; between the Clyde at Dumbarton and the Forth at Alloa it is only 32 miles. The shape of Ireland is more regular than that of Great Britain, and bears a considerable resemblance to a rhomboid. Its greatest length, in a direct line north and south is 230 miles, and its greatest breadth from west to east is 180 miles. The British Isles rise from a submarine plateau connecting them geologically with the rest of Europe, of which at a remote period they must have actually formed a part. This is evidenced too by the similarity of the British fauna and flora to the continental.

*Area of the British Isles.*

| | Sq. Miles. | | Acres. |
|---|---|---|---|
| England | 50,823 | .... | 32,527,070 |
| Wales | 7,363 | .... | 4,712,283 |
| Isle of Man | 227 | .... | 145,325 |
| Channel Islands | 75 | .... | 48,322 |
| Scotland | 29,820 | .... | 19,084,659 |
| Ireland | 32,531 | .... | 20,819,928 |
| Total | 120,839 | | 77,337,586 |

*Surface.*—The north part of Britain is, for the most part, rugged, mountainous, and barren, this being the character of much of Scotland. To the N. of a line drawn from the Firth of Clyde on the W. to Stonehaven on the E. coast is the region generally known as the Highlands, divided into a northern and a southern portion by the great hollow of Glenmore through which runs the Caledonian Canal. The chief feature of the southern portion is the mountain mass of the Grampians, the culminating points of which, Bennevis and Benmacdhui, are the highest British summits, being respectively 4406 and 4296 feet. South of the Highlands lies the plain of the Forth and Clyde, a region of coal and iron, in which the chief manufacturing industries of Scotland are carried on. South of this again is the elevated region of the Southern Highlands or Southern Uplands, less rugged and more pastoral than the Highlands proper. Towards the S. E. are the Cheviot Hills, on the borders of England and Scotland. Here commences the long Pennine chain running south into England, branching off into the moun-

tains of Cumberland and the Lake district (Cumbrian Mountains), and terminating beyond the Peak of Derby, in the heart of England. The highest summit of the English mountains is in the northwest (Lake district), namely, Scawfell, 3210 ft. Further south and west is the Cambrian range, spread over the greater part of Wales, and containing, among others, the highest mountains of S. Britain—Snowdon, 3571 feet. Over great parts of England the elevations are mostly insignificant, and the general character of the country is that of undulating plains. In Ireland the most marked feature is the dreary expanse of bogs which stretches over its interior. This flatness of the interior is caused by the fact that most of the mountain masses attain their greatest elevation near the coast, and rapidly decline as they recede from it. Carn Tual, in the southwest, the culminating point of the island, is 3404 feet high.

*Rivers and Lakes.*—The mountains which constitute the principal watersheds of Great Britain being generally at no great distance from the W. coast, the rivers which descend from them in that direction have generally a short course, and are comparatively unimportant. The two great exceptions to this rule are the Clyde and the Severn, which owe both their volume and the length of their course to a series of longitudinal valleys, which instead of opening directly to the coast, take a somewhat parallel direction. The chief rivers entering the sea on the E. coast, proceeding from N. to S., are the Spey, Don, Dee, Tay, Forth, Tweed, Tyne, Ouse, Trent, and Thames, the last named being commercially the greatest river of the world. No river of importance empties itself either on the N. or S. coast. Owing to the great central flat of Ireland its rivers usually flow on in a gently winding course in different directions to the sea. Those of importance are not very numerous; but one of them, the Shannon, is the longest river of the British Isles, its length being about 225 miles; while the Thames is 215. The Tay (length 130 miles) is said to have the largest volume of water. The lakes of the British Isles are distinguished for beauty rather than size; the largest, but among the least interesting, is Lough Neagh, in the north of Ireland. While both Great Britain and Ireland are provided with numerous streams, which are either themselves navigable or act as the feeders of canals, the coasts supply a number of excellent harbors invaluable to the commerce of the country.

*Climate.*—Their maritime situation has a favorable effect on the climate of the British Isles, making it milder and more equable than that of continental countries in the same latitude. The temperature of the Atlantic, raised by the influx of the Gulf-stream, is communicated to the winds and vapors which are wafted along its surface, and the prevailing winds in Britain being from the southwest, the country is kept constantly at a relatively high temperature. The southwest winds, too, are charged with vapor, and often bring rain, thus supplying the country with abundant moisture. Ireland, from its more westerly position, has these characteristics in the most marked degree, the warmth and moisture of the west winds making it markedly a 'green isle.' For the same reason the western shores of the islands have a milder and more equable temperature than the eastern shores, the former being on an average one or two degrees cooler in summer and several degrees warmer in winter. The range of temperature between the coldest and the warmest months is at London 26°, in England generally 24½°, while at Paris it is 30°. The range at Edinburgh is 25°, while at St. Petersburg it is 55°. The mean winter temperature at Dublin is 39°, or 3 degrees higher than that of Milan, Pavia, Padua, or the whole of Lombardy.

*Agriculture.*—In almost every district in Great Britain where the plow can move farming of a superior description may be seen, and, according to Professor Thorold Rogers, 'it may be confidently averred that owing to improvement in stock and seeds, agriculture in the United Kingdom is at a higher level than in any other country.' Thorough and systematic draining, the extensive use of artificial manure, and the employment of the newest implements are among the chief features of modern British agriculture. The ensilage method of preserving green fodder has recently been introduced, and promises to produce important results. A peculiar feature of English as distinguished from Scotch husbandry is the large amount of arable land forming permanent hayfields. These are kept fertile by heavy doses of farmyard manure, and yield grass of admirable feeding qualities. Much of the land thus employed is naturally of poor quality, but by the careful management of perhaps a century has become covered with a close sward of the richest green, and of admirable feeding qualities. The great extent of the permanent pasture is also a feature of Irish agriculture. In the rearing and fattening of stock there is no

BRITISH ISLES
Scale of Miles
0 25 50 100
Through Railroads
Other Railroads
Submarine Cables
Important towns are shown in heavy face type
C.S. HAMMOND & CO., N.Y.
ATLANTIC OCEAN
NORTH SEA
IRISH SEA
ENGLISH CHANNEL
ST. GEORGE'S CHANNEL
Bristol Channel
SHETLAND ISLANDS
ORKNEY IS.
MAINLAND
HEBRIDES
LONDON
CHANNEL ISLANDS
Longitude West from Greenwich
Long. East

country in the world that can be compared to several districts of Great Britain. It is sufficient to mention, among horses, the race-horse, the finest type, and the parent of the best existing breeds of that animal; among cattle, the shorthorns of Durham; and among sheep, the celebrated Southdowns and Leicesters. The principal cereal crops grown in England are wheat, barley, and oats, wheat covering the largest area; the principal green crops are turnips, potatoes, mangolds, vetches, etc. In Ireland and Scotland oats are by far the principal grain crop; while the chief green crop in Ireland is the potato, in Scotland the turnip. Hops are grown to a large extent in Kent, and less extensively in some other parts of southern England. The most marked feature in the agriculture of Great Britain during recent years is the gradual increase in the proportion which the amount of land in grass bears to that under corn and green crops, an increase without doubt attributable to the increased facility with which cereals can be obtained from foreign countries, making it more profitable for British farmers to devote themselves to the rearing of live stock. Of the whole area of Great Britain, less than 60 per cent. is under the plow or in pasture; but in England the proportion is about 75 per cent. and in Wales above 60 per cent. while in Scotland it is under 25 per cent. (so much of Scotland being barren). In Ireland the proportion is about 75 per cent. The agriculture of Ireland, though the soil itself offers every advantage to the farmer, is in a very different condition from that of Great Britain, being in a very backward state on the whole, this mainly due to the subdivision of holdings and to overcropping, combined with the ignorance and unskilfulness of the people. The British government is beginning to remedy these defects and Ireland promises again to prosper.

*Minerals.*—Such is the mineral wealth of the British Isles that there is scarcely a metal or mineral product of economical value which is not worked, to a greater or less extent, beneath their surface. Among these the first place is due to *coal*, which, in regard both to the quantity raised annually and its aggregate value, surpasses any other mineral product. The coal-fields are not confined to one particular district, but extend as a series of basins in an irregular curve from central Scotland through northern and middle England to the Bristol Channel. On the east side of Scotland there are coal-fields both north and south of the Forth; farther west lie the coal-basins of Lanark, Renfrew, and Ayrshire; the first famous throughout the world for the immense manufacturing establishments which it mainly has called into existence and made prosperous. In the north of England is the great coal-field centering near Newcastle, which gives it its name. The proximity of this field to the sea, and the excellence of the coal, unrivaled for domestic use, early made it a great theater of mining operations. Wales is also rich in coal, but Ireland has very little. The total area of coal lands is estimated at about 9000 sq. miles; the annual yield is about 260,000,000 metric tons (2205 lbs.). The iron ores smelted in Great Britain are principally carbonates. The most important iron-stone districts are those of Yorkshire, especially the rich Cleveland district in the North Riding, Lancashire, Cumberland, Staffordshire, Lincolnshire, Northamptonshire, and the coal-measures of Scotland. Blast furnaces are most numerous in Yorkshire, Staffordshire, Cumberland, Durham, Lancashire, S. Wales, and Lanarkshire. The quantity of pig-iron produced is about 10,000,000 tons; steel (Bessemer and open-hearth) 6,000,000 tons. Tin, lead, and zinc are the metals next in importance to iron. Another important article is salt, chiefly from rock salt and brine pits. Granite, freestone, and roofing-slate quarries are numerous, except in the southeastern part of England.

*Fisheries.*—The principal British fisheries are those of salmon, herring, haddock, ling and cod, turbot, soles, and other flat fish. The first is carried on chiefly in the rivers and estuaries of Scotland and Ireland; the second chiefly on the coasts and islands of Scotland, large quantities of herrings being cured and exported. Cod, haddocks, etc., are caught in great multitudes in the North Sea, particularly on the Dogger Bank. Among minor fisheries may be mentioned those of mackerel, pilchards, oysters, and lobsters. The facilities for conveyance now offered by railways has given a great impulse to the trade in fresh fish, and the London market alone draws to itself a large share of the fishing results all round the coasts. The value of the fish caught annually is over $50,000,000.

*Manufactures.*—These, in the order of their importance, begin with *cotton*. In this branch of industry Great Britain still remains far ahead of other countries. The Liverpool and Manchester district and S. Lancashire as a whole are the chief seats of the manufacture. The number of spindles in operation in 1910 was

about 54,000,000, as compared with 28,000,000 in the United States. The peculiar excellence of the wool furnished by the English flocks made *woolens* the most ancient and for centuries the staple manufacture of England. Now this manufacture is next in importance to that of cotton, and draws largely for its supplies on other countries, particularly on the Australian colonies. The chief seats of the woolen manufacture are in England—the West Riding of Yorkshire, Lancashire, Gloucestershire, and Wiltshire being the most distinguished for broadcloths; Norfolk for worsted stuffs, Leicestershire and Nottinghamshire for woolen hosiery. Blankets and flannels have numerous localities, but for the finer qualities the west of England and several of the Welsh countries are most conspicuous. Carpets of every quality and pattern are extensively made at Kidderminster, Halifax, Leeds, etc. The woolen manufacture of Ireland is on a very limited scale, being confined to a few broadcloth factories, and a few blankets and flannels. Scotland has made much more progress, but still bears no proportion to England. The chief seats of the Scotch woolens are Kilmarnock for carpets, bonnets, and shawls; Stirling and its neighborhood for carpets and tartans; Ayrshire for blankets, etc., Galashiels, Selkirk, and other places in the basin of the Tweed for the cloth known as 'tweeds,' the manufacture of which originated here, though it has since extended to several parts of England. The *linen* manufacture is also important. In England the chief seat of the manufacture is Leeds and its vicinity, and other parts of the West Riding; also parts of Lancashire and Durham. Linen is the only staple of Ireland, where it is carried on chiefly in the province of Ulster, Belfast being the great center of the industry. In Scotland the manufacture is important. Besides plain linen, it includes osnaburgs, sheetings, sailcloth, sacking, etc.—chief seat, Dundee (with other Forfarshire towns); and diaper and damask—chief seat, Dunfermline. The staples of both towns are by far the most important of their kind in the kingdom. Large quantities of jute are also used in this manufacture, especially at Dundee. Silk manufacture is small. Besides the manufactures already mentioned, there are a great number which, though separately of less importance, absorb immense sums of capital, exhibit many of the most wonderful specimens of human ingenuity, and give subsistence to millions of the population. Among the most important of these are the several branches of the hardware industry, the manufacture of steam engines and all kinds of machinery, of arms and ammunition, of plate, jewelry, and watches, of chemicals, dyes, manures, etc., of furniture, of glass, earthenware and porcelain, etc. Of vast extent also is the paper manufacture, in connection with which are various industries, of which it may be considered as, directly or indirectly, the parent—type-founding, printing, books, engraving, etc. Another very important industry is that of shipbuilding, which has its chief seats on the Clyde and Tyne.

*Commerce.*—Of the extent of the commerce carried on by railway, river, canal, and highway there are little or no means of forming an estimate; but the foreign trade of the country can be stated. Britain carries on commerce with almost all countries. The trade with her own colonies and dependencies is very large, but not more than one-third as much as with foreign countries. The foreign as well as the inland trade is greatly promoted by the highly developed system of communication which now exists. The annual imports amount to about £600,000,000 ($3,000,000,000), and the exports to about £450,000,000 ($2,250,000,000). The development of British shipping, when compared with that of other nations, is even more remarkable than that of its foreign commerce. Not only is the great bulk of the trade between Britain and other foreign countries carried on in British ships, but so also is a large part of the trade between one foreign country and another. Hence we find that the magnitude of the mercantile marine of the United Kingdom is far greater than that of any other country, its sea-going tonnage reaching a total of over 18,000,000 tons.

*Religion.*—Every form of religion enjoys the most complete toleration, but there are two churches, one in England having an Episcopal form of government, and one in Scotland with a Presbyterian organization, established by law and partly supported by state endowments. Both of these are Protestant, and both in England and Scotland the great majority of those who do not belong to the established church are also Protestants. In England, however, these all belong to churches having a different organization from that of the Anglican Church, while in Scotland most of them belong to churches virtually identical with the established church both in creed and in organization. In Ireland there has been no state church since 1871, when a branch of the Anglican Church there established was disestablished. The great majority of the people are Roman Catholics.

*Education.*—All education in England

was long entirely voluntary. The first comprehensive measure for the promotion of elementary education by the state was passed in 1870. Its chief provisions were for the election of school-boards in districts in which there was a deficiency of school accommodation, with power to build and maintain schools out of rates levied for the purpose, and for the giving of aid by parliamentary grant to these board-schools as well as to previously existing schools. Discretionary power was originally given to the school-boards to enforce the attendance of children in their districts, but by subsequent enactments compulsory attendance of children at school from 5 to 14 years of age has been made the law for the whole of England and Wales, a school-attendance committee being established to look after this matter wherever there was no school-board. Recent acts of Parliament (1899–1904) have materially changed conditions. The parish and other attendance committees have been changed into school-boards, which may be denominational, all under a general Board of Education. This legislation applies only to England and Wales. The most numerous Board schools are those of the Church of England. The Scotch Education Act, passed in 1872, was from the first more comprehensive than the English one, requiring the election of school-boards in every burgh and parish, and making school-attendance compulsory throughout the country. The school age is from 5 to 13. Ireland is still far behind in the matter of education. Elementary education there is under the superintendence of the commissioners of national education, a body incorporated in 1845, with power, among other things, to erect and maintain schools wherever they think proper. In England there are a number of endowed grammar schools, and also the great public schools of Eton, Harrow, Winchester, Rugby, Charterhouse, Westminster, etc. In Scotland and Ireland also there are a number of secondary schools; but they form no part of an organized system.

For the higher education there are in England the universities of Oxford, Cambridge, London, Durham, and the Victoria University, Manchester; and in addition to these are colleges, some of them called 'university colleges,' at Leeds, Newcastle, Nottingham, Bristol, Birmingham, and other places, besides other institutions giving a university education in one or more departments; the training institutions for teachers; and the colleges belonging to the different dissenting bodies. London University is properly only an examining board, but in connection with it there are, in London, University College and King's College. In Scotland there are the four universities of Edinburgh, Glasgow, Aberdeen, and St. Andrews, a university college at Dundee, and the normal or training schools of the different religious bodies. Ireland has the University of Dublin, the Queen's Colleges of Belfast, Cork, and Galway, in connection with the Royal University of Ireland, which is merely an examining and degree-conferring body; the Roman Catholic university, and Maynooth and other Roman Catholic colleges. As was to be expected, the expenditure in connection with popular education has greatly increased since the passing of the education acts. The annual parliamentary grants, which in 1840 amounted to $150,000, had risen in 1870 to $4,573,600, and later to $30,000,000.

*People.*—The earliest inhabitants of the United Kingdom known to history were Celts, who inhabited both Great Britain and Ireland at the time of the Roman occupation. In the 5th and 6th centuries, however, the Celts were displaced through the greater part of South Britain and in the eastern lowlands of North Britain by the Anglo-Saxons, a Teutonic race from which the modern English and Lowland Scotch are mainly descended. The Celts as a distinct people were gradually confined to the mountainous districts of Wales and Cornwall and the Highlands of Scotland, and only in Wales and Scotland has the Celtic language survived in Great Britain, being still also spoken by many in the west of Ireland. There is a considerable Celtic element, however, among the population everywhere. The English language is the direct descendant of that spoken by the Anglo-Saxons, but contains a strong infusion of French elements introduced by the Normans in the 11th and following centuries, as well as other elements, chiefly of Latin and Greek origin, introduced in later times.

The population of the United Kingdom is very unequally distributed in the three countries of which the kingdom is composed. England and Wales had, in 1891, a population equal to 498 to the square mile, which is a denser population than any country in Europe except Belgium and Saxony; that of Ireland at the same date was 144 to the square mile, and that of Scotland only 132. The increase that has taken place in the population of Great Britain during the last century is very remarkable. At the first census, which took place in 1801 (and which did not include Ireland), the whole population of Great Britain was found to be a

little under 11,000,000; at the census of 1901 it was 36,999,946. The growth in the population of the whole kingdom between 1831, the date of the first reliable Irish census, and 1911 was from 24,400,000 to 45,216,665. Of these, England had 34,043,076; Scotland, 4,759,445; Wales, 2,032,193; and Ireland, 4,381,951, the remainder being divided among the smaller islands and the soldiers and sailors abroad. This growth, however, was confined to Great Britain, for in Ireland the population has greatly declined (in 1841 it was fully 8,000,000). In 1911 the population of England and Wales was 36,075,269.

*Extent of Empire.*—The area of the British empire, as the total territory under British rule is usually termed, including recent acquisitions in Africa, is estimated at 11,467,294 square miles, with a population of about 396,294,752. In 1901 it was distributed as follows—The British isles and European possessions (Gibraltar, Malta and Gozo); area, 121,391 square miles; population, 42,041,305; British India and feudatory states, Ceylon, Straits Settlements, Hong Kong, etc., in Asia; area, 1,827,234; population 291,014,006; Cape Colony, Natal, Sierra Leone, Mauritius, St. Helena, and other possessions in Africa, or islands adjacent, 359.073 square miles; pop. about 4,961,500; Canada, Newfoundland, Jamaica, Trinidad, and other West India islands; Honduras, Guiana, and all possessions in America, north or south, 3,614,224 square miles; pop. 6,721,251; Australia, Tasmania, New Zealand, Fiji, New Guinea, etc.; area, 3,259,199 sq. miles; pop. 4,285,297. The increase of British colonies, especially of Canada and Australia, in population, wealth, and trade, has been something prodigious within the last few years. Self-government has been conceded to the larger colonies.

*Constitution.*—Under the name of a constitutional and hereditary monarchy the government of Britain is vested in a sovereign and the two houses of parliament—the House of Lords and the House of Commons. Laws passed by these houses, and assented to by the sovereign, become the laws of the land. But under this general fixity of form the center of real power may change greatly, as it has in Great Britain within the last two centuries. The sovereign's right of veto on acts of parliament has practically passed into desuetude, while of the two legislative houses the House of Commons, from its being the expression of the national will as a whole, has become the real center of power and influence. Popular rights and liberties are thus secured by the fact that the most influential part of the legislature is composed of members dependent on the confidence and trust of popular constituencies. Thus though the powers of the parliament may be regarded as unlimited, yet it must always in the end give way before a decided and clear expression of public opinion. It is often said, therefore, that the constitution of Great Britain is in great part an unwritten law, and this unwritten law is continually receiving additions and adapting itself to the new forces and needs of the time. This natural flexibility of the British constitution is one of its greatest merits, and what most distinguishes it from the more rigid systems of other countries. One of the best examples of this quiet growth of unwritten law is the position occupied by such a body as the cabinet, a body never officially recognized by any act of parliament, and wholly unknown to the written law, yet practically the highest executive body in the kingdom, though nominally the executive government is vested in the sovereign. On this subject the late Mr. Bagehot remarks: 'The efficient secret of the English constitution may be described as the close union, the nearly complete fusion, of the executive and legislative powers. According to the traditional theory as it exists in all the books, the goodness of our constitution consists in the entire separation of the legislative and executive authorities, but in truth its merit consists in their singular approximation. The connecting link is the cabinet. By that new word we mean a committee of the legislative body selected to be the executive body.'

*The Sovereign.*—The fundamental maxim upon which the right of succession to the throne depends is, that the crown is, by common law and constitutional custom, hereditary, and that the right of inheritance may from time to time be changed or limited by parliament; under which limitations the crown still continues hereditary. It descends to the males in preference to the females, strictly adhering to the rule of primogeniture. The sovereign is of age at eighteen years. The heir to the crown has, since the time of Edward III, inherited the title of Duke of Cornwall, and receives that of Prince of Wales by letters patent. The power of the sovereign is limited by the laws. The divine right, so obstinately maintained by the Stuarts, was never recognized by the nation, and William III, Mary, and Anne ascended the throne, according to express declarations,

only by virtue of a transmission of the crown to them by the nation. But the maxim has been acknowledged, particularly since the Restoration, that there is no power in the state superior to the royal prerogatives: the acts of the king are therefore subject to no examination, and the king is not personally responsible to any tribunal: hence the maxim: The king can do no wrong. Yet there is sufficient provision for confining the exercise of the royal power within the legal limits. 1. All royal acts are construed in accordance with the laws, and it is taken for granted that the king can never intend anything contrary to law. 2. The counselors of the king are responsible for the royal acts, and, as well as all those who are concerned in the execution of them, are liable to impeachment and examination, without the right of defending themselves by pleading the royal commands. 3. The parliament and the judicial tribunals have also the right to discuss freely such royal acts, and, in particular, parliament and each individual member of the upper house has the right to make remonstrances to the crown. 4. Individuals are protected from any abuses of the royal power by the Habeas Corpus Act, the liability of the agents to prosecution, the right of complaining to parliament, and the liberty of the press.

The king is the supreme head of the state in peace and was the lord paramount of the soil, the foundation of justice and honor, and the supreme head of the church. He has the prerogative of rejecting bills in parliament, which, however, has not been exercised since the year 1692. As the generalissimo, or the first in military command within the kingdom, he has the sole power of raising and regulating fleets and armies, which, however, is virtually controlled by the necessity he is under of obtaining supplies from parliament. As the fountain of justice, and general conservator of the peace of the kingdom, he alone has the right of erecting courts of judicature, and all jurisdictions of courts are derived from the crown. As the fountain of honor, of office, and of privilege, he has the power of conferring dignities, privileges, offices, etc. In the foreign relations of the nation he is considered the nation's representative, and makes treaties, declares war, etc. As advisers he has the privy-council and the cabinet (which see). Yet these privileges, as a rule, have long been in desuetude, and any act approaching oppression or an arbitrary exercise of power by a British sovereign, would be apt to lead to revolutionary resistance.

*The Parliament.*—The origin of the British Parliament has been sought rightly enough in the *witenagemôts* or national assemblies of the Anglo-Saxons. In somewhat different form these were continued in the Norman times, and as early at least as the reign of Henry III we find not only the barons and the high ecclesiastics, but also the knights of the shire with the burgesses summoned to attend. These formed the *three estates*, now known as the lords spiritual, the lords temporal, and the commons. In the reign of Edward III (1327–77) the separation of the estates into two houses—the House of Lords, consisting of the lords spiritual and the lords temporal, and the House of Commons, consisting of the knights, citizens, and burgesses—became settled. All the peers were not originally entitled to a seat as a matter of right, but only those who were expressly summoned by the king. Every hereditary peerage now, however, confers the right of a seat in the House of Lords or Upper House. The number is indefinite, and may be increased at the pleasure of the crown, which, however, cannot deprive a peer of the dignity once bestowed. The upper house at present comprises about 560 members. By the act of union with Scotland, 16 representatives of the Scottish peerage are elected by the Scottish nobility for each parliament's duration (seven years), and 28 are elected for life by the peers of Ireland.

The parliament is not permanent, and it is the royal prerogative to summon and dissolve it. The first business of the Commons is to elect a speaker. The members then take the oath of allegiance, and when this is done the king's speech is read, being answered by an address from each house. In the upper house the lord-chancellor presides, holding the position of the speaker in the Commons. All grants of subsidies or parliamentary aids must originate with the House of Commons, and the Lords have not the right to amend, or even to accept or reject, a money bill. As the parliament is summoned, so it is prorogued by the royal authority. A dissolution of the parliament is effected either by the authority of the crown or by length of time. The House of Commons being chosen but for seven years, at the expiration of that time parliament is dissolved *ipso facto*. The lower house of parliament has the direction of all financial concerns; and there is no subject which may not be brought before it by petition, complaint, or motion of a member. The upper house is the supreme court of judicature in the nation. In civil cases it (now represented

by the Lords of Appeal in Ordinary) is the supreme court of appeal from the superior tribunals of the three kingdoms. In indictments for treason or felony, or misprision thereof, where the accused is a peer of the realm, the House of Lords are the judges of the law and the fact. In cases of impeachment by the House of Commons the House of Lords are also the judges. All the forms of a criminal trial are then observed, and the verdict must be by a majority of at least twelve votes.

The House of Commons previous to the Reform Bill of 1832 consisted of 658 members, of whom 513 were for England and Wales, 45 for Scotland, and 100 for Ireland. In this representation there were great injustices and anomalies. Many of the boroughs had quite fallen into decay, so that a place like the famous Old Sarum, which consisted only of the ruins of an old castle, sent two members to parliament, while great manufacturing towns like Manchester and Birmingham were absolutely without representation. Not only the *rotten boroughs*, as these decayed constituencies were called, but also in many cases the towns, where the right of suffrage belonged to a small number of freeholders, were practically in the hands of a single family, and in this way a few great houses—Norfolk, Bedford, Devonshire, and the Pelhams, etc. —commanded more than 100 seats in parliament. For the few places that were in the hands of independent voters a shameless system of bribery existed, in spite of the prohibitory laws, and the prices of votes were generally well known: a seat for a small place cost about $25,000. The Reform Bill of 1832 brought great changes. Occupiers of lands or tenements in counties at a yearly rent of not less than $250, and occupiers as owner or tenant of a house or shop in a borough of a yearly value of $50, now received the franchise. Fifty-six rotten boroughs were wholly disfranchised; thirty boroughs were deprived of one member; and one borough (Melcombe-Regis cum Weymouth, which had four) of two members; twenty-two boroughs were created in England, to return two members each, and nineteen boroughs to return one member each. Besides taking away the right of election from many insignificant places, and vesting it in large, or at least in tolerably numerous, constituencies in new boroughs, the act introduced something like uniformity in the qualifications of the voters of the old boroughs and cities, and extended the elective franchise from close corporations, or privileged bodies, to the citizens at large.

After several unsuccessful attempts by Lord John Russell, Lord Palmerston, and Mr. Gladstone to pass bills for further reform, in 1867 Mr. Disraeli, then chancellor of the exchequer, succeeded in carrying through a bill which conferred the borough franchise on all householders who had resided in the borough for twelve months previous to the last day of July, in any year, and had been assessed for and paid poor-rates, and on all lodgers who had occupied for a like period lodgings of the yearly value of $50 unfurnished. In countries the franchise was bestowed on occupiers as owners or tenants of subjects of $60 ratable value, and the copyhold and leasehold franchise was reduced from $50 to $25. This bill related only to England and Wales, but bills of a similar character were passed for Scotland and Ireland in the following year. In this way the electorate, which was 1,352,970 in 1867, rose to 2,243,259 in 1870. The total number of members still remained at 658. To Manchester, Liverpool, Birmingham, and Leeds were assigned three members each, and to London University one. Populous counties were further divided, and to many of the divisions two members each were given. The reform in the franchise and in representation, thus instituted, was added to by acts passed at later dates, and in 1917 a bill was passed extending the vote in a limited degree to women who had reached the age of thirty years.

*Army and Navy.*—The British army is raised on the authority of the sovereign, who is looked on as its head; but the number of troops and the cost of the different branches are regulated annually by a vote of the House of Commons. In 1911 the peace strength of the army was 257,000, reserves 543,000; war strength 800,000; unorganized force available for duty 1,200,000. No British citizen is obliged to bear arms except for the defense of his country; but all able-bodied men, from eighteen to thirty-five, are liable to militia service, the militia being raised, when required, by ballot. Enlistment among the regulars is either for twelve years' army service (long service), or for seven years' army service and five years' reserve service (short service). The head of the military administration is the secretary of state for war. See *Army*.

The administration of the navy is carried on by the Board of Admiralty, consisting of six members, and having at its head the First Lord, who has supreme authority. The estimates provide for a total of about 126,000 men and boys in the naval service, including officers and

marines. The most important and formidable portion of the navy is the armor-clad fleet, which consists of about eighty vessels, including those not yet completed. See *Ironclad Vessels.*

*Finance, Revenue and Expenditure.*—The practice of borrowing money in order to defray a part of the war expenditure began in the reign of William III. At first it was customary to borrow upon the security of some tax, or portion of a tax, set apart as a fund for discharging the principal and the interest of the sum borrowed. This discharge was, however, very rarely effected, and at length the practice of borrowing for a fixed period was almost entirely abandoned, and most loans were made upon *interminable* annuities, or until such time as it might be convenient for government to pay off the principal. Originally the interest paid by the government on these loans was comparatively high and subject to considerable variation. But in the reign of George II a different practice was adopted. Instead of varying the interest upon the loan, the rate of interest was generally fixed at three or three and a half per cent. the necessary variation being made in the principal funded. Thus, if the government were anxious to borrow in a three-per-cent. stock, and could not negotiate a loan for less than four and a half per cent. they effected their object by giving the lender, in return for every £100 advanced, £150 three-per-cent. stock—that is, they bound the country to pay him or his assignees £4, 10*s.* a year in all time to come, or, otherwise, to extinguish the debt by a payment of £150. In consequence of this practice the principal of the debt now amounts to far more than the sum actually advanced. At the death of William III, the public debt, partly by reason of the long wars, amounted to £16,394,702, the public income being £3,895,205. By far the greater part of the next reign also was a time of war, and on the death of Queen Anne the national debt amounted to £54,145,363. The reign of George I, was undisturbed by war, which enabled the government of the time to reduce the debt by £2,053,125, so that at the accession of George II, the whole amount of the debt was £52,092,238. At the conclusion of the Peace of Paris after the Seven Years' war it was £138,865,430, and at the end of the American war, £239,350,148. During the French war £601,500,334 of new debt was contracted, and on the 1st of February, 1817, when the English and Irish exchequers were consolidated, the total debt was £840,850,491. Since then the debt has been greatly reduced, and in 1910 reached a total of approximately £750,000,000.

*History.*—The island in the remotest times bore the name of *Albion.* From a very early period it was visited by Phœnicians, Carthaginians, and Greeks, for the purpose of obtaining tin. Cæsar's two expeditions, 55 and 54 B.C., made it known to the Romans, by whom it was generally called *Britannia;* but it was not till the time of Claudius, nearly a hundred years after, that the Romans made a serious attempt to convert Britain into a Roman province. Some forty years later, under Agricola, the ablest of the Roman generals in Britain, they had extended the limits of the Provincia Romana as far as the line of the Forth and the Clyde. Here the Roman armies came into contact with the Caledonians of the interior, described by Tacitus as large-limbed, red-haired men. After defeating the Caledonians under Galgacus at 'Mons Grampius' Agricola marched victoriously northwards as far as the Moray Firth, establishing stations and camps, remains of which are still to be seen. But the Romans were unable to retain their conquests in the northern part of the island, and were finally forced to abandon their northern wall and forts between the Clyde and the Forth and retire behind their second wall, built in 120 A.D. by Hadrian, between the Solway and the Tyne. Thus the southern part of the island alone remained Roman, and became specially known as Britannia, while the northern portion was distinctively called Caledonia. The capital of Roman Britain was York (Eboracum). Under the rule of the Romans many flourishing towns arose. Great roads were made traversing the whole country and helping very much to develop its industries. Christianity was also introduced, and took the place of the Druidism of the native British. Under the tuition of the Romans the useful arts and even many of the refinements of life found their way into the southern part of the island.

Thus from the time of the Roman conquest, and still more decidedly after the Saxon invasions in the fifth century, the history of Britain branches off into a history of the southern part of the island, afterwards known as England, and a history of the northern part of the island, afterwards named Scotland. It was not till the union of the crowns in 1603 that the destinies of England and Scotland began again to unite; and it was not till the final union of the parliaments in 1707 that the histories of the two countries may be said to merge into one.

From this latter period accordingly we shall give an outline of the history of the United Kingdom. See also the articles *England*, *Scotland*, and *Ireland*.

The measure which declared the parliaments of England and Scotland united, and the two countries one kingdom, known as the United Kingdom of Great Britain, was passed, after violent opposition, in the reign of Queen Anne, 1st of May, 1707. This union, however much it was opposed by the prejudices and interests of particular men or classes at the time, has contributed very much to the prosperity of both countries. The Grand Alliance, which it had been the aim of William's later years to form between Holland, Austria, and England against the threatening growth of French power, now held the field against the armies of France, and the victories of Marlborough at Blenheim and Ramillies, and the taking of Gibraltar and Barcelona, ended in the Treaty of Utrecht in 1713, by which the British right of sovereignty over Hudson Bay, Newfoundland, Nova Scotia, Minorca and Gibraltar was acknowledged, and the foundation of Britain's imperial and colonial power securely laid. The remainder of Anne's reign was distracted by the never-ending altercations of domestic parties. She died on the 1st of August, 1714; and with her ended the line of the Stuarts, who had held the scepter of England 112 and that of Scotland 343 years.

At her death George I, elector of Hanover, maternally descended from Elizabeth, daughter of James I, according to the Act of Settlement ascended the throne of Britain. The Whigs under this prince regained that superiority in the national councils of which they had long been deprived, and this, along with the suspension of the Habeas Corpus Act and some other extreme precautionary measures, increased the irritation of the Tory and Stuart party. In 1715 the Earl of Mar in Scotland and the Earl of Derwentwater in England raised the standard of rebellion and proclaimed the Chevalier St. George (the Old Pretender) king. But the insurrection, feebly supported by the people, was soon suppressed. In 1716 the Septennial Act was passed, making parliament of seven instead of three years' duration. In 1720 occurred the extraordinary growth and collapse of the South Sea Company. From this date till 1742 the government was virtually in the hands of Sir Robert Walpole, the first, we might say, of modern premiers, governing the cabinet and chiefly responsible for its doings. Walpole had great sagacity, prudence, and business ability, and could manage dexterously the king, the parliament, and the people alike. It is true that in the case of the parliament he achieved this by undue influence in elections and a scandalous use of bribery. But the power he thus acquired was generally wisely used. The failure of the war with Spain into which he had reluctantly entered drove him from office, and in 1742 his long ministry came to an end. In 1743 George II, frightened at the dangers to Hanover, dragged Britain into the wars between France, Prussia, and Austria, regarding the succession of the Emperor Charles. George himself fought at the head of his troops at Dettingen (1743), where he obtained a complete victory over the French, which was balanced, however, later on by the defeat at Fontenoy (1745).

A fresh attempt was now made to restore the Stuart family to the throne of Britain. Charles Edward, son of the Old Pretender, having been furnished by France with a small supply of money and arms, landed on the coast of Lochaber, in the Western Highlands, in 1745, and was joined by a considerable number of the people. Marching southwards with 1500 Highlanders, his forces increasing as he advanced, he entered Edinburgh without opposition; and having defeated Sir John Cope near Prestonpans he marched into England. He now took Carlisle, and advanced through Lancaster, Preston, and Manchester, to Derby, within 100 miles of London; but finding himself disappointed of expected succors from France, and the English Tories, contrary to his expectations, keeping aloof, he commenced his retreat into Scotland, closely pursued by the king's troops, whom he again defeated at Falkirk. With this victory his good fortune terminated. The Duke of Cumberland, having arrived from the continent, put himself at the head of the forces which were destined to check the rebels; and the armies having met at Culloden, near Inverness, Charles was completely defeated. After lurking for six months amid the wilds of Inverness-shire, he at length, with much difficulty, escaped to France.

The war of the Austrian succession, which still continued and which was the cause of hostilities between the French and British in India as well as elsewhere, was terminated by the treaty of Aix-la-Chapelle in 1748. During most of this period Pelham and his brother, the Duke of Newcastle, had been the ruling ministers, and in their hands the art of government had reached a low level both

as regards morality and ability. In 1752 the *new style* of reckoning time was introduced and the *old style* being eleven days behind, the 3d of September, 1752, was called the 14th. At the same time the 1st of January was fixed as the opening day of the year instead of the 25th of March.

Soon after, the French, uneasy at the growing colonial power of Britain, made a determined effort against the British colonies and possessions in North America and the East Indies, and at first the British met with several disasters in America. In 1756 the Seven Years' war broke out, Austria and France being allied on the one side, and Prussia and England on the other, and ill success attended the British arms in Europe also. Fortunately, a great war minister, William Pitt, now took the helm of state. In 1758 the British made themselves masters of several French settlements in North America, while the attack made by Wolfe on Quebec in 1759 was completely successful, and gave Britain the whole of Canada. The same year the British and their allies defeated the French at Minden in Prussia. In the East Indies the French were even less successful than in America. Clive's victory at Plassey (1757) and Coote's at Wandewash (1760) secured the British empire in the East, and together with the naval feats of Hawke and Boscawen made England the greatest of maritime and colonial powers.

On the accession of George III in 1760 hostilities were still carried on, generally to the advantage of the French as far as the theater of war in Germany was concerned, but still more to their loss in the other quarters of the world where they were engaged with the British in a struggle for supremacy, and this notwithstanding that Spain had now joined her forces to those of France. At length the success of the British arms induced France and Spain to accede to terms, and the war ended by the Treaty of Paris in 1763. The French relinquished nearly all their possessions in North America; Minorca was restored to Britain; in the East Indies they got back their factories and settlements, on condition that they should maintain neither forts nor troops in Bengal; Cuba and Manila were resigned to the Spaniards. In Europe everything was restored to the *status quo*.

The expenses of this war, which had been undertaken partly for the defense of the American colonies, had added upwards of £72,000,000 to the national debt. It seemed to the British people to be just that the Americans should be taxed to assist in payment of the interest. The Americans did not deny the justice, but replied that if they were to be taxed they had a right to be represented in parliament, in order that, like other British subjects, they might be taxed only in consequence of their own consent. Grenville, then the prime-minister, stood to his purpose, however, and introduced a bill for imposing certain stamp duties on the American colonies. The Americans protested and resisted, and partly by the influence of the great Pitt, who had steadily opposed the measure, the bill was withdrawn. On the illness of Pitt, now Lord Chatham, in 1767, Townshend became premier, and again revived the project of taxing the Americans by imposing duties on tea; and in 1770 Lord North, as his successor, set himself to carry it out. The result was that in 1775 America had to be declared in a state of rebellion, and a war began, in which both France and Spain joined the revolted colonies, and of which the result was the recognition of the independence of the United States. On the American side of this struggle the great name is that of George Washington. On the British side the war was unskillfully conducted, and though they gained some successes these were more than counterbalanced by such blows as the capitulation of Burgoyne with nearly 6000 men at Saratoga (1777), and of Cornwallis at Yorktown with 7000 (1781). Against their European foes the British could show such successes as that of Admiral Rodney off Cape St. Vincent (1780); the brilliant defense of Gibraltar by General Eliott (1779–82); and Admiral Rodney's victory over the French fleet in the West Indies (1782). The war closed with the Peace of Versailles in 1783. Britain finally acquired several West Indian islands; Spain got Florida and Minorca, France Pondicherry and Chandernagore in India. The struggle had added over £100,000,000 to the British national debt.

From 1783 to 1801 the government of Britain was directed by William Pitt, the younger son of Lord Chatham, who when only twenty-four years of age was placed as first lord of the treasury and chancellor of the exchequer. The affairs of Ireland and India, and the impeachment of Warren Hastings, were among the first subjects which occupied the attention of Pitt's ministry. In 1782 the Irish had been able to extort from Britain, then engaged in her struggle with the American colonies, the right to establish an independent parliament; so

that from this year there were two independent governments in the British Isles till 1800, when Pitt, who had in the interval had some experience of the difficulties arising out of two co-ordinate legislatures, contrived once more to unite them.

In 1789 the French Revolution began. For a time there was considerable sympathy in England with this movement; but as the revolutionaries proceeded to extreme measures there was a reaction in English feeling, of which Edmund Burke became the great exponent, and the execution of Louis XVI gave rise to diplomatic measures, which finally terminated in a declaration of war against Britain by the National Convention, February 1, 1793. At first Britain co-operated with Prussia, Austria, etc., against France, and successes were gained both by sea and land; but later on the continent the armies of the French Republic were everywhere triumphant, and in 1797 Britain stood alone in the conflict, and indeed soon found a European coalition formed against her. The war was now largely maritime, and the naval successes of Jervis off St. Vincent and Duncan off Camperdown were followed, when Bonaparte led an expedition to Egypt, having India as its ultimate object, by the victories of Nelson in Aboukir Bay, and Abercromby at Alexandria. In 1798 a rebellion in Ireland had to be crushed. Peace was made in 1802 by the Treaty of Amiens, only to be broken by another declaration of war in 1803, as the ambitious projects of Napoleon became evident. In spite of the efforts of Pitt (who died in 1806) in the way of forming and supporting with funds a new coalition against France, the military genius of Napoleon swept away all opposition on land, though the naval victory of Trafalgar (1805) established England's supremacy on the seas. Napoleon, who had assumed the title of Emperor of the French in 1805, and was now virtually the ruler of Europe, put forth his Berlin decrees (1807), prohibiting all commerce with Britain wherever his power reached, set his brother Joseph on the throne of Spain, and occupied Portugal. But the spirit of resistance had now taken deep root in the British people, and in 1808 troops were sent into Spain under Sir John Moore, and a year later Wellington, then General Wellesley, landed in Portugal. Then began that famous series of successful operations (the Peninsular War) which drove back the French into their own country, and powerfully contributed to undermine the immense fabric of Napoleon's conquests. The failure of the French invasion of Russia led to Paris being occupied in 1814, Napoleon deposed and exiled to Elba, and Louis XVIII placed on the throne of France. Escaping in 1815, Napoleon appeared once more in the field with a large army. Wellington and Blücher hastened to oppose him, and at Waterloo Napoleon's long career of conquest ended in a crushing defeat. The restoration of Louis followed, and Napoleon was sent to the prison of St. Helena. Of her conquests Britain retained Tobago, St. Lucia, Mauritius, the Cape of Good Hope, Demerara, Essequibo, Berbice, Heligoland, and Malta; Ceylon and Trinidad had been gained in 1802. Therefore Britain emerged from this long struggle with a very great increase of territorial possessions and political importance.

After the termination of the wars with Napoleon many things concurred to make a troublous era in the home administration. The new burden of debt which the wars had left on the nation, the bad harvests of 1816 and 1817, a succession of governments which had no idea but that of absolute resistance to all reforms, etc.; all these contributed to increase discontent. The result was a strong Radical agitation, accompanied often by serious riots throughout the country, more especially in the large towns, and loud demands for reform in parliament and the system of representation. The death of George III and accession of George IV, in 1820, made little change in this respect. From 1822 a succession of able statesmen, Canning, Peel, and Lord Grey, gave the government a more liberal turn, and did much to satisfy the popular demands. The Catholics were admitted to parliament; the severity of the old restrictions on commerce was relaxed; and in the face of a determined opposition Earl Grey carried the Reform Bill of 1832 (two years after the accession of William IV), which gave large manufacturing towns a voting power in some proportion to their importance, and practically transferred the center of political power from the aristocratic to the middle classes. The next great public measure was the abolition of negro slavery in every British possession in 1834.

William IV died June 20, 1837, and was succeeded by Victoria. The year following is notable as that in which the Chartists began their movement for reform, which continued more or less active, with popular assemblies, presentations of monster petitions, and occasional tumults, till 1848, when it was without

much trouble suppressed. The same years saw the struggle of the Anti-Corn Law League, of which Cobden and Bright were the chiefs, and which was finally successful; Sir Robert Peel, the leader of the Tory party, himself proposing the repeal of the corn duties (1846). The principle of free trade had further victories in the repeal of the navigation laws, and in the large abolition of duties made during Lord Aberdeen's ministry (1853).

In 1852–53 dissension arose between Russia and Turkey regarding the rights of the Latin and Greek churches to preferable access to the 'holy places' in Palestine. The Emperor of Russia, resenting concessions made to French devotees, sent Prince Menschikoff to Constantinople to demand redress, and not being satisfied, war was declared, June 26, 1853. On the plea that it was impossible to leave Russia a free hand in dealing with Turkey, France and Britain formed an alliance against Russia, March 28, 1854. The invasion of the Crimea followed; several important battles (Alma, Balaklava, Inkerman) took place, resulting in favor of the allies, till at length Sebastopol fell (1855), and peace was signed the following year at Paris. Russia ceded a part of Bessarabia to Turkey, and consented to the free navigation of the Danube and the neutrality of the Black Sea. (See *Crimean War.*)

Scarcely was the Crimean war over when Britain was threatened with the loss of her possessions in India through the mutiny of the Sepoys. For a time the authority of government was entirely suspended throughout the greater part of Bengal, the whole of Oude, and a large portion of Central India; but in a comparatively short time 70,000 British troops, pouring in from Burmah, Mauritius, the Cape, and elsewhere, entirely suppressed the rebellion. (See *Indian Mutiny.*) One result of the mutiny was that, by a bill passed Aug. 2, 1858, the sovereignty hitherto exercised over the British possessions in India by the East India Company was transferred to the British crown.

Two wars with China (1858 and 1860), during which Canton was bombarded and Pekin taken by united forces of Britain and France, opened up five new Chinese ports to trade, with other advantages. The great Civil war in America from 1861 to 1865 had for a time a disastrous effect on the cotton-trade in Lancashire, causing widespread distress. (See *Cotton Famine.*) Between 1861 and 1867 the Fenian movement, which had for its object the separation of Ireland from the United Kingdom, occasioned some excitement. See *Fenians.*

Parliamentary reform was attempted by several governments without success, until the government of the Earl of Derby in 1867 passed a measure establishing the principle of household suffrage. This year also saw the passing of the act by which the Dominion of Canada was constituted. In 1867 the Abyssinian expedition set out, and effected its object—the relief of English captives—in the spring of 1868. In the same year Lord Derby was succeeded by Mr. Disraeli as leader of the Conservative party, then in office. Before the end of the year a general election put the Liberals in power. In 1869 Mr. Gladstone's administration passed a bill for the disestablishment of the Irish Church. In 1870 an Irish Land Law Bill, having for its object the regulation of the relations between landlord and tenant, became law; and during the same session the act of parliament establishing a national system of education for England was passed. In 1871 the purchase of commissions in the army was abolished. Next followed the Ballot Act and the Scotch Education Act. Early in 1874 Mr. Gladstone dissolved parliament, and a large Conservative majority being returned, Mr. Disraeli (afterwards Earl of Beaconsfield) again became premier. The Ashantee war, begun the previous year, was brought to a successful termination early in 1874. In 1876 the title of Empress of India was added to the titles of the queen. During the Russo-Turkish war of 1877–78 Britain remained neutral, but took an important part in the settlement effected by the Berlin Congress, and acquired from Turkey the right to occupy and administer Cyprus. Then followed a war in Afghanistan, a war with the Kaffirs of Zululand, and a brief war with the Boers of the Transvaal.

A new parliament was returned in 1880 with a large Liberal majority, and Mr. Gladstone once more became premier. This parliament passed a land-act for Ireland (1881), an act for putting down crime in Ireland (1882), a reform act equalizing the borough and county franchise (1884), and a redistribution of seats act (1885), both already described. The intervention of Britain in Egyptian affairs led to the bombardment of Alexandria by the British fleet (July, 1882), and the sending of an army into Egypt to quell the rebellion headed by Arabi Pasha, which was soon accomplished; while the rising under the Mahdi in the

Sudan caused British troops to be despatched to Suakim, and another force to be sent by way of the Nile (in the autumn of 1884) to relieve General Gordon at Khartoum, an object which it was too late to accomplish. Since that date Britain has been the controlling power in Egypt and has recovered for it the lost Sudan territory, and in the years that followed the British holdings of African territory were largely increased, Britain gaining the most in the partition of Africa among the European powers. Oct. 11, 1899, war was declared by the Boers of the Transvaal and Orange Free State, the aim being the destruction of the British paramountcy in South Africa. This led to the annexation of those states by the British in 1900, after a fierce contest, in which the British met with numerous disastrous reverses at first. In 1900 a new parliament was elected, which again supported the Conservative ministry, with a slightly increased majority. Queen Victoria died January 22, 1901, and was succeeded by her son, Edward VII.

The reign of the new monarch was one of peaceful conditions, yet of frequent threats of war and of continued preparation for possible hostilities, especially with Germany, which had become a great commercial rival of Britain. This led to a great increase in the British navy, and to the building of a class of warships known as Dreadnoughts, larger and more powerful than any then in existence. But no advantage was gained by this, for the other nations responded by building still larger vessels. To secure her colonial interests in the East Britain made a treaty of alliance with Japan for mutual aid and assistance in certain exigencies. Changes in political condition took place in the great British colonies. Canada had long been combined into a practically independent commonwealth and the Australian colonies took similar action in 1900, forming an Australian federation. In 1910 the South African colonies took similar action, forming a South African Union composed of Cape Colony, Transvaal, Orange River Colony and Natal. In India, meanwhile, great unrest was displayed by the natives, who showed a strong revolutionary spirit and in Egypt a spirit of revolt against British domination was manifested. Nearer home the question of Irish unrest was prominent, the desire for home rule being vigorously displayed, while the misery of the Irish peasantry called for some radical steps of alleviation. This was in large measure accomplished in a law passed by parliament in 1903, intended to bring about the abolition of the evils of landlordism. Parliament undertook to assist tenants to pay for their farms and also to loan them a large sum of money at low interest and on long terms of repayment. These measures proved highly beneficial and promised to bring to an end the long misery of the Irish farming population. In England questions of political economy became prominent. The Conservative ministry, which had long been in power under Lord Salisbury and his successor, Balfour, came to an end in 1905 when a Liberal ministry succeeded under Campbell-Bannerman, who was succeeded in 1908 by Herbert Henry Asquith, with David Lloyd-George as Chancellor of the Exchequer. The latter played a prominent part by bringing in a financial measure for the adequate taxation of the estates of the great landholders, which had long paid mere nominal taxes. A system of old age insurance was also adopted and went into effect on January 1, 1909, under which small pensions were to be paid to men over seventy years of age. The attempt to pass the radical budget was bitterly resisted in the House of Lords, and only passed after a new parliament had been elected in which the Liberals were supported. Edward VII died on May 6, 1910. He was succeeded by his oldest surviving son under the title of George V, his coronation taking place in June, 1911. The events of his early reign were a movement which ended in depriving the House of Lords of its power of vetoing acts of the Lower House, and a measure widely increasing the principle of national insurance. Later measures of importance were the disestablishment of the Church of England in Wales and an act providing Home Rule for Ireland. Upon the declaration of hostilities in Europe, in July, 1914, Britain announced that in accordance with the terms of her agreement with France she would not permit Germany to attack France or violate the neutrality of Belgium, guaranteed by the Powers in 1832. War against Germany was accordingly declared. Britain was very differently situated from the other countries involved in the stupendous struggle, which began in August, 1914. While Germany, France, Russia, Austria and Italy had systems of conscription and large numbers of citizens who had been trained in military duties, Britain depended solely on a volunteer army, and its interests were so widespread over the earth that its small standing army was scattered among its many colonies, especially in India, there being comparatively few at home and in readiness for immedi-

ate action. But, on the other hand, she might fairly claim to hold the dominion of the sea, her great war fleet being equal in fighting power to that of any two of the other nations. Thus, while from a military point of view the British Empire was unfit to take immediate part in a great war, from a naval point of view it stood at the head of the nations, having a superiority in sea power that Germany found itself unable to cope with during the war, and which swept all German power except that of the submarines from the face of the open sea. This superiority of Great Britain was immediately taken advantage of, a powerful fleet of British dreadnoughts, cruisers, destroyers, and other types of warships being sent without a day's delay to hold the German navy close prisoner in its naval bases at Heligoland and Kiel Canal, and so well has the siege been maintained that only on one occasion have the German ships sought to break through, and that unsuccessfully. A few German cruisers in the open sea when the war began did a degree of damage to British shipping, but these were soon disposed of and the British war fleet remained masters of the ocean. This, however, was not the case with the great merchant fleet of the island kingdom. The submarine, Germany's one potent naval weapon, soon began to make its power felt, and as it grew in numbers and efficiency there was some reason to believe that the German project of starving England by sending its food-carrying merchant fleet to the bottom might eventually be realized. By the end of the third year of the war these sea wasps had done vast damage and the question of how best to defeat them remained an open one. Aside from the siege of the German naval bases and the patrol work kept up around the British islands, Britain made one vigorous naval assault, this being an effort to reach and take Constantinople by aid of a squadron of war vessels. This matter seems to have been very badly managed, no land force being sent to support the work of the fleet. The result was that three warships were sunk by the Turkish forts and the others repelled. Subsequently, a land force was sent to the peninsula of Gallipoli, but the Turks had been given time to strongly fortify this route and the enterprise proved a disastrous failure. As regards the work of the German submarines, the most notable success was the sinking, without warning, by a torpedo, on May 7, 1915, of the great British liner *Lusitania*, 1152 lives being lost, 114 of these being Americans. This was the first step in the series of attacks on American citizens on the high seas which eventually brought the United States into the war.

The government of Great Britain meanwhile had been actively engaged in raising a large volunteer army, in broad financial movements for the purpose of financing the enormously expensive struggle, and in strenuous activity in manufacturing the vast quantity of cannon and other munitions of war needed, and in supplying the people with food from abroad by aid of its great merchant fleet. The work of building up an army went on with discouraging slowness, and eventually conscription had to be resorted to. The result was that by the end of 1917 the island empire had 4,000,000 trained troops in the field, in addition to the large number killed, wounded and taken prisoners in the more than three years of desperate warfare. In gaining these, the colonies of the British Empire had loyally aided the mother country, Canada furnishing 500,000 men; Australia, New Zealand and South Africa other large quotas, while India, which many feared would manifest a rebellious spirit, was equally loyal, large contingents of Hindu recruits being raised to aid Britain in its struggle in the west. The army thus gathered was widely distributed. Its great field of activity was on the western front, where the Germans were using the greatest forces to extend their holdings in France and Belgium. Here the small British force early in the field did valiant work in aiding the French in the great turning battle of the Marne, and, subsequently, as the army grew stronger and better equipped, they took a vigorous and successful part in the mighty tide of warfare on the western Belgian front, aiding the French in the gradual pushing back of the heavy German forces in that section. Other fields of British activity were in the eastern field, in Gallipoli, as stated, at Salonica, held by a strong British and French force, in Mesopotamia and Palestine, where Bagdad and Jerusalem were taken from Turkey, and in Africa, where all the German colonies in that continent in time fell under Allied control. Such was the position held by Great Britain in the European war at the close of the year 1917.

**Britannia** (bri-tan'ni-a), the ancient name of Britain.

**Britannia Metal,** also called WHITE METAL, a metallic compound or alloy of tin, with a little copper and antimony, used chiefly for teapots, spoons, etc. The general proportions are 85½ tin, 10½ antimony, 3 zinc, and 1 copper.

**Britannicus** (bri-tan'i-kus), son of the Roman emperor Claudius, by Messalina, born A.D. 42, poi-

soned A.D. 56. He was passed over by his father for the son of his new wife Agrippina. This son became the emperor Nero, whose fears that he might be displaced by the natural successor of the late emperor caused him to murder Britannicus.

**British Association,** FOR THE ADVANCEMENT OF SCIENCE, a society first organized in 1831, mainly through the exertions of Sir David Brewster, whose object was to assist the progress of discovery, and to disseminate the latest results of scientific research, by bringing together men eminent in all the several departments of science. Its first meeting was held at York, on September 26, 1831, under the presidency of Lord Milton; and the principal towns of the United Kingdom have on different occasions formed the place of rendezvous, a different locality being chosen every year. The *séances* extend generally over about a week. The society is divided into sections, which, after the president's address, meet separately during the *séances* for the reading of papers and conference. Soirees, conversaziones, lectures, and other general meetings are usually held each evening during the meeting of the Association. As the funds which the society collects at each meeting are more than sufficient to cover its expenses, it is enabled to make money grants for particular scientific inquiries.

**British Central Africa,** the general name given to the British protectorates in South Central Africa, but more particularly to the large protectorate on the Shiré and about Lake Nyasa. In 1907 the official title of this territory was changed to Nyasaland (which see).

**British Columbia,** a British colony in the southwestern section of Canada and forming with Vancouver Island a province of the Dominion of Canada. It is situated partly between the Rocky Mountains and the Pacific, partly between Alaska and the meridian of 120° W., and extends from the U. S. boundary north to the 60th parallel N. lat. Area, 372,630 sq. miles (including Vancouver Island). Till 1858 it was part of the Hudson Bay Territory; in that year gold discoveries brought settlers, and it became a colony. Vancouver Island, 16,000 sq. miles, became a colony at the same time, but was afterwards joined to British Columbia; the conjoined colony entered the Dominion as a province in 1871. The coast-line is much indented, and is flanked by numerous islands, the Queen Charlotte Islands being the chief after Vancouver. The interior is mountainous, being traversed by the Cascade Mountains near the coast, and by the Rocky Mountains further west. There are numerous lakes, generally long and narrow, and lying in the deep ravines that form a feature of the surface and are traversed by numerous rivers. Of these the Fraser, with its tributary the Thomson, belongs entirely to the colony, as does also the Skeena; while the upper courses of the Peace River and of the Columbia also belong to it. All except the Peace find their way to the Pacific. Its mountain ranges (highest summits: Mount Forbes, 13,400 feet, and Mount Brown, 16.000 feet) afford magnificent timber (including the Douglas pine and many other trees); and between the ranges are wide grassy prairies. Part of the interior is so dry in summer as to render irrigation necessary, and the arable land is comparatively limited in area, but there is a vast extent of splendid pasture land. The climate is mild in the lower valleys, but severe in the higher levels; it is very healthful. The chief products of the colony are gold, coal, silver, iron, copper, galena, mercury, and other metals; timber, furs, and fish, the last, particularly salmon, being very abundant in the streams and on the coasts. Gold exists almost everywhere, but has been obtained chiefly in the Cariboo district. The total yield since 1858 has been over $150,000,000. The coal is found chiefly in Vancouver Island, and is mined at Nanaimo, where large quantities are now raised. Mining, cattle-rearing, agriculture, fruit-growing, salmon-canning, and lumbering are the chief industries. Victoria, on the S. E. coast of Vancouver Island, is the capital and chief town of the colony. Near Victoria is Esquimalt, a British naval station. Vancouver, the terminus of the Canadian Pacific Railway, at the mouth of the Fraser, has grown with much rapidity, and had in 1911 a population of 123,902. Other towns of some importance are New Westminster, Nanaimo and Rossland. Besides this railway there is one between Nanaimo and Victoria, and construction by the Grand Trunk, Canadian Northern, and Canadian Pacific systems has been active. Steamers now run to China and Japan in connection with the Canadian Pacific Railway, and lines to Australia, Honolulu, etc., are in operation. Like the other provinces of the dominion, British Columbia has a separate Parliament and administration. (See *Canada.*) Schools are supported entirely by government. Pop. in 1881, 65,954, including about 25,000 Indians; (1911) 392,480.

**British East Africa,** includes the East Africa and Uganda protectorates and the islands of Zanzibar and Pemba, and is bounded, E., by the Indian Ocean, Abyssinia and Italian Somaliland; S., by German East Africa and Lake Victoria Nyanza; W. by the Congo Free State and French Ubangi, and N. it merges into the Egyptian Sudan. It has a total area of more than 1,000,000 sq. miles and a population of over 5,000,000, including little over a thousand Europeans. It is largely an elevated plateau, traversed by the upper Nile and other rivers, and with lofty mountain masses. It contains, in whole or part, Lakes Victoria, Albert, and Albert Edward (Nyanza), Rudolf, etc. A large part of the surface is covered with grass and well suited for ranching purposes. Iron and copper are abundant in the Uganda region, and the chief products and exports are ivory, rubber, gum copal, hides, cattle and goats. Its animals include many species of antelopes, with the lion, elephant, rhinoceros, hippopotamus, buffalo, leopard, giraffe, zebra, hyena, etc., and it was the scene of Theodore Roosevelt's hunting experience in 1909–10. Capital, Mombasa. Pop. of capital about 30,000.

**British Guiana** (gē-ā'nā), a territory on the N.W. coast of South America, with an area of about 90,277 sq. miles. It is bounded by Venezuela on the W., Dutch Guiana on the E., Brazil on the S. and the Atlantic Ocean on the N. The country is flat near the ocean, with an elevated section in the interior, where there are dense forests. The Essequibo is its longest river, and the Orinoco reaches the sea within its area. Gold is found in moderate quantities and vegetation is luxuriant, the crops including sugar-cane, rice, corn, wheat, cacao, vanilla, cinnamon and tobacco; the exports sugar, molasses, rum, cotton and lumber. Pop. about 300,000, largely Africans and East Indians. The British claim goes back to 1650, and led in the late 19th century to boundary disputes with Venezuela. The dispute continued until 1895, when President Cleveland demanded that it should be settled by arbitration. This was accomplished in 1899 and a definite boundary established.

**British Gum.** See *Dextrine.*

**British Honduras.** See *Honduras, British.*

**British Museum,** the great national museum in London, owes its foundation to Sir Hans Sloane, who, in 1753, bequeathed his various collections, including 50,000 books and MSS., to the nation, on the condition of £20,000—less by £30.000 than the original cost—being paid to his heirs. Montague House, which was bought for the purpose for £10,250, was appropriated for the museum, which was first opened on the 15th of January, 1759. The original edifice having become inadequate, a new building in Great Russell Street was resolved upon in 1823, the architect being Sir R. Smirke, whose building was not completed till 1847. In 1857 a new library building was completed and opened at a cost of £150,000. It contains a circular reading-room 140 feet in diameter, with a dome 106 feet in height. This room contains accommodation for 300 readers comfortably seated at separate desks, which are provided with all necessary conveniences. More recently, the accommodation having become again inadequate, it was resolved to separate the objects belonging to the natural history department from the rest, and to lodge them in a building by themselves. Accordingly a large natural history museum has been erected at South Kensington, and the specimens pertaining to natural history (including geology and mineralogy) have been transferred thither, but they still form part of the British Museum. Further additions to the Great Russell Street buildings were made in 1882. The British Museum is under the management of 48 trustees. It is open daily, free of charge. Admission to the reading-room as a regular reader is by ticket, procurable on application to the chief librarian, there being certain simple conditions attached. The library, which is now one of the largest and most valuable in the world, has been enriched by numerous bequests and gifts, among others the splendid library collected by George III, during his long reign. A copy of every book, pamphlet, newspaper, piece of music, etc., published anywhere in British territory, must be conveyed free of charge to the British Museum. The museum contains eight principal departments, namely, the department of printed books, maps, charts, plans, etc.; the department of manuscripts; the department of natural history; the department of oriental antiquities; the department of Greek and Roman antiquities; the department of coins and medals; the department of British and medieval antiquities and ethnography; and the department of prints and drawings.

**British North America,** a name under which are included the Dominion of Canada and the colony of Newfoundland, comprising all the mainland north of the

United States (except Alaska) and a great many islands.

**British South Africa.** See *Union of South Africa.*

**Brittany,** or BRETAGNE (bret-ăn'y'), an ancient duchy and province of France, corresponding nearly to the modern departments of Finistère, Côtes du Nord, Morbihan, Ille et Vilaine, Loire Inférieure. It is supposed to have received its name from the Britons who were expelled from England and took refuge here in the fifth century. Along the coast and towards its seaward extremity the country is remarkably rugged, but elsewhere there are many beautiful and fertile tracts. Fisheries employ many of the inhabitants. The people still retain their ancient language, which is closely allied to Welsh, and is exclusively used by the peasantry in the western part of the province.

**Brittle** (brit'l), STARS (Ophiuroidea), a class of Echinodermata not far removed from the starfishes, but with a more centralized body, longer and more sharply defined arms and greater activity. The name refers to the extreme ease with which the arms break. Another common name is *sand stars*, referring to their occasional occurrence on the shore.

**Britton** (brit'on), JOHN, an English writer on architectural antiquities, born in 1771; died in 1857. In 1801 appeared the *Beauties of Wiltshire*, in two volumes, by J. Britton and E. W. Brayley. These collaborators, with others, subsequently completed a similar work for all the other counties of England (London, 1801–16, eighteen vols.; 1825, twenty-six vols.; etc.). In 1805 Britton published his *Architectural Antiquities of England* in five 4to volumes, which was followed by his *Cathedral Antiquities*, in fourteen volumes, 1814–35, and *Dictionary of the Architecture and Archæology of the Middle Ages*, 1832–38. A large number of works of a similar character bear his name as joint or sole author or editor.

**Britzka, Britzska** (britz'ka), a kind of small carriage, the head of which is always a movable calash, and having a place in front for the driver and a seat behind for servants.

**Brives-la-Gaillarde** (brēv-lå-gă-yärd), a town of Southwestern France, dep. Corrèze, on the Corrèze, surrounded by fine boulevards planted with elms. Manufactures: woolens, cottons, candles, brandy, etc. Pop. 14,954.

**Brixen** (brik'sen), an old town of Austria, in Tyrol, 104 m. from Vienna by rail, with a cathedral. Pop. 5767.

**Brixham** (briks'am), a seaport and sea-bathing resort, England, Devonshire, on the south of Torbay. Brixham was the place where William III landed, Nov. 4, 1688. Pop. 7954.

**Briza** (brī'za), a genus of grasses, commonly called quaking grass, maiden's hair, or lady's tresses. There are about thirty species, chiefly found in South America. Some of these species are sometimes to be found in gardens as ornamental plants.

**Broach,** or BARODACH (brōch, bå-rōch'), a town in Guzerat (Gujerat), Hindustan, on the Nerbudda, one of the oldest seaports of Western India, with a considerable coasting trade. The town was taken by storm by the British in 1772, and, with the district, ceded to them by treaty with Scindiah in 1803. Pop. 42,300.

**Broach** (brōch; French *broche*, a spit), a term sometimes applied to a spire that springs directly from a tower, there being no intermediate parapet.

**Broad Arrow,** a government mark placed on British stores of every description (as well as on some other things), to distinguish them as public or crown property, and to obliterate or deface which is felony. Persons in possession of goods marked with the broad arrow forfeit the goods and are subject to a penalty. The origin of the mark is not clearly known.

Broad Arrow.

**Broadcast** (brąd'cast), a mode of sowing grain by which the seed is cast or dispersed upon the ground with the hand or with a machine devised for sowing in this manner; opposed to planting in drills or rows.

**Broad Church,** a name given originally to a party in the Church of England, assuming to be midway between the Low Church or Evangelical section and the High Church or Ritualistic; now widely applied to the more tolerant and liberal section of any denomination.

**Broad Piece,** a name sometimes given to English gold pieces broader than a guinea, particularly Caroluses and Jacobuses.

**Broadside** (brąd'sīd), in a naval engagement, the whole discharge of the artillery on one side of a ship of war. The term is also applied

to any large page printed on one side of a sheet of paper, and, strictly, not divided into columns.

**Broad'stairs,** an English watering-place, east coast of Kent, 2 miles N. of Ramsgate. Pop. (with St. Peter's), 8929.

**Broad'sword,** a sword with a broad blade, designed chiefly for cutting, formerly used by some regiments of cavalry and Highland infantry in the British service. The claymore or broadsword was the national weapon of the Highlanders.

**Brocade** (brō-kād'), a stuff of silk, enriched with raised flowers, foliage, or other ornaments. The term is restricted to silks figured in the loom, distinguished from those which are embroidered after being woven. Brocade is in silk what damask is in linen or wool.

**Broccoli** (brok'o-li), a late variety of the cauliflower, hardier and with more color in the flower and leaves.

**Brocks** (broks), the local name of the ancient circular castles of Scotland known also as duns and to antiquaries as 'Pictish towers.' They are numerous in northern Scotland and are supposed to date from about the sixth to the tenth centuries. They were apparently places of refuge for the rural population when attacked by marauders, and have thick stone walls and other means of defense.

**Brocken** (brok'en), the highest summit of the Harz Mountains (3742 feet), in Prussian Saxony, celebrated for the atmospheric conditions which produce the appearance of gigantic spectral figures in the clouds, being shadows of the spectators projected by the morning or evening sun.

**Brockhaus** (brok'hous), FRIEDRICH ARNOLD, founder of the eminent German publishing house still carried on by his grandsons, was born in 1772; died in 1823. In 1811 he settled at Altenberg, where the first edition of the *Conversations-Lexikon* was completed, 1810–11. The business rapidly extended, and he removed to Leipzig in 1817. There are now chief branches in Berlin and Vienna, and among the literary undertakings of the house have been several important critical periodicals and some large historical and bibliographical works. The *Conversations-Lexikon* distinctively associated with the name of Brockhaus has now reached a thirteenth edition.—HERMANN BROCKHAUS, son of F. A. Brockhaus, orientalist, was born at Amsterdam in 1806; died in 1877. From 1848 till his death he was professor of Sanskrit at Leipzig, and published many works on oriental literature. He edited the great *Allgemeine Encyklopädie of Ersch und Gruber*, published now by his father's firm.

**Brockton** (brok'ton), a city of Plymouth Co., Massachusetts, formerly North Bridgewater, 20 miles S. of Boston. It has very large shoe factories, employing 15,000 hands, also manufactures of lasts, dies, blacking, machinery, webbing, boxes and all accessories entering into the manufacture of shoes. Pop. 56,878.

**Brockville** (brok'vil), a town of Canada, prov. of Ontario, on the left bank of the St. Lawrence, about 40 miles below Kingston. It is a station on the Grand Trunk Railway, and has considerable hardware and other manufactures, as steam engines, chemicals, agricultural implements, etc. Pop. (1911) 9372.

**Brodie** (brō'dii), SIR BENJAMIN COLLINS, an English surgeon, born in 1783; died in 1862. He was the leading surgeon of his day, and attended George IV, and was sergeant-surgeon to William IV and to Victoria. He was made a baronet in 1834; from 1858 to 1861 was president of the Royal Society, and was connected with many other scientific and learned societies. He published a number of works connected with his profession.—His eldest son, SIR BENJAMIN COLLINS BRODIE, a celebrated chemist, was born in London 1817, died 1880. In 1855 he was appointed professor of chemistry at Oxford.

**Brody** (brō'di), a town in Austrian Galicia, near the Russian frontier, 58 miles E. N. E. of Lemberg. It has 17,360 inhabitants, about three-fourths of whom are Jews. The commerce with Russia and Turkey is important.

**Broglie** (brol-yē), a family of Italian origin, distinguished in the annals of French wars and diplomacy.—1. FRANÇOIS MARIE, DUC DE, marshal of France, born in 1671; died in 1745; was highly distinguished in the field, and also in diplomacy.—2. VICTOR FRANÇOIS, DUC DE, eldest son of preceding, likewise marshal of France, born in 1718; died in 1804; served in Italy, Bohemia, Bavaria, and Flanders. Was minister of war for a short time in 1789, and took part in the invasion of Champagne, 1792.—3. CLAUDE VICTOR, PRINCE DE, born in 1757; guillotined 27th June, 1794; was the third son of Victor François. He entered at first into the views of the revolutionary party, and was appointed field-marshal in the army of the Rhine, but upon his refusal to acknowledge the decree of the

10th of August suspending the royal authority was deprived of his command, and afterwards summoned before the revolutionary tribunal and led to the guillotine.—4. ACHILLE LÉONCE VICTOR CHARLES, DUC DE, peer of France, son of Claude Victor, born in 1785; died in 1870. In 1816 he married a daughter of Madame de Staël, and was made a member of the chambers of peers. After the revolution of 1830 the Duc de Broglie and Guizot were the chiefs of the party called *Doctrinnaires*. He was minister of public instruction for a short time in 1830, and minister of foreign affairs from October 1832, to April, 1834. In 1849 he was a conservative member of the Legislative Assembly, and after the *coup d'état* he continued a bitter enemy of the imperial régime. His latter years were devoted to philosophical and literary pursuits, and in 1856 he was elected a member of the French Academy.—5. ALBERT, DUC DE, son of the preceding, statesman and author, born in 1821. His principal work, *The Church and the Roman Empire in the Fourth Century*, has passed through many editions. He served as ambassador at London, minister of foreign affairs, and head of a short-lived royalist ministry in 1877. He died in 1901.

**Brogue** (brōg; Ir. and Gael. *brog*), a coarse and light kind of shoe made of raw or half-tanned leather, of one entire piece, and gathered round the foot by a thong, formerly worn in Ireland and the Highlands of Scotland. The term is also used of the mode of pronunciation of English words peculiar to the Irish.

**Broke** (brųk), SIR PHILIP BOWES VERE, a British admiral, born in 1776; died in 1841; distinguished himself, particularly in 1813, as commander of the *Shannon*, in the memorable action which that vessel, in answer to a regular challenge, fought with the United States vessel *Chesapeake* off the American coast, and in which the latter was captured.

**Broken Wind**, a disease in horses, one often accompanied with an enlargement of the lungs and heart, which disables them for bearing fatigue. In this disease the expiration of the air from the lungs occupies double the time that the inspiration of it does; it requires also two efforts rapidly succeeding to each other, attended by a slight spasmodic action, in order fully to accomplish it. It is caused by rupture of the air-cells, and there is no known cure for it.

**Broker** (brōk'er), an agent who is employed to conclude bargains or transact business for others in consideration of a charge or compensation, which is usually in proportion to the extent or value of the transaction completed by him, and is called *brokerage*. In large mercantile communities the business of each broker is usually limited to a particular class of transactions, and thus there are brokers with several distinctive names, as *bill brokers*, who buy and sell bills of exchange for others; *insurance brokers*, who negotiate between underwriters and the owners of vessels and shippers of goods; *ship brokers*, who are the agents of owners of vessels in chartering them to merchants or procuring freights for them from one port to another; *stock brokers*, the agents of dealers in shares of joint-stock companies, government securities, and other monetary investments.

**Bromberg** (brom'bėrg), a town of Prussia, province of Posen, on the Brahe, near its confluence with the Vistula. Among its industries are machinery, iron-founding, tanning, paper, tobacco, chicory, pottery, distilling, and brewing. The Bromberg Canal connects the Brahe with the Netz, and thus establishes communication with the Vistula, the Oder, and the Elbe. Pop. 54,229.

**Brome** (brōm), ALEXANDER, a minor English poet and dramatist, born in 1620; died in 1666. He was the author of many royalist songs and epigrams. Published *The Cunning Lovers*, a comedy; *Fancy's Festivals*, *Songs*, etc.; *Translation of Horace*.

**Brome,** RICHARD, poet and dramatist, died in 1652. He wrote *The Jovial Crew*, *The Northern Lass*, and many other plays, ten of which were edited and published by Alexander Brome soon after his death. He was originally a servant of Ben Jonson's, on whose style he endeavored to mold his own.

**Brome-grass,** the name given to grasses of the genus *Bromus*. Nearly 200 species have been described, occurring both in the Old and the New World. They are known by having their spikelets many-flowered, two awnless glumes to each floret, two paleæ or valves, the lowermost of which has a rough, straight, rigid awn proceeding from below the tip of the valve. They are not held in much estimation by the farmer, but an Australian species, *B. Schraderi*, is strongly recommended as a forage plant.

**Bromeliaceæ** (brō-me-li-ā'se-ē), the pineapple family, a natural order of endogenous plants, taking its name from the genus *Bromelia*

(so called after a Swedish botanist, Olaus *Bromel*) to which the pineapple was once incorrectly referred, and consisting of herbaceous plants remarkable for the hardness and dryness of their gray foliage. They abound in tropical America, commonly growing epiphytically on the branches of trees. With the exception of the pineapple (*Ananassa sativa*), *the Bromeliaceæ* are of little value, but some species are cultivated in hothouses for the beauty of their flowers. They can exist in dry hot air without contact with the earth, and in hothouses are often kept hung in moist moss.

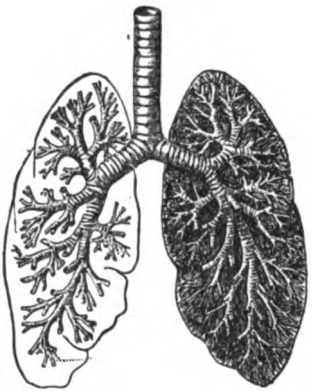
**Bromine** (brō'mĭn, brō'min; Gr. *brōmos*, a fetid odor), a non-metallic element discovered in 1826; symbol Br, atomic weight 80. In its general chemical properties it much resembles chlorine and iodine, and is generally associated with them. It exists, but in very minute quantities, in seawater, in the ashes of marine plants, in animals, and in some salt springs. It is usually extracted from bittern by the agency of chlorine. At common temperatures it is a very dark reddish liquid, has a powerful and suffocating odor, is fuming, volatile, and corrosive, and emits a red vapor. It has bleaching powers like chlorine, and is very poisonous. Its density is about four and a half times that of water. It combines with hydrogen to form *hydrobromic acid gas*, which is colorless, acrid, and irritating, and soluble in water. With oxygen and hydrogen it forms *hypodromous*, *bromous* and *bromic acids*. *Bromide of potassium* (KBr) has sedative properties, and is used in medicine; *bromide of silver* is used in photography.

**Bromley** (brom'li), a town of England, County Kent, 8 miles S. S. E. of London, with a hospital for forty widows of clergymen, and a palace formerly belonging to the Bishop of Rochester. A mineral spring, St. Blaize's Well, has had repute since before the Reformation. Pop. (1911) 33,649.

**Bromsgrove** (broms'grōv), a town of England, in the county of Worcester, 13 miles S. W. of Birmingham, on the left bank of the Salwarp. Nailmaking is the chief industry; there are also chemical works, a cloth-button manufactory, etc. Pop. (1911) 8928.

**Bronchi** (bron'kī), the two branches into which the trachea or windpipe divides in the chest, one going to the right lung, the other to the left, and ramifying into innumerable smaller tubes—the *bronchial tubes*.

**Bronchitis** (bron-kī'tis), an inflammation of the mucous membrane of the bronchial tubes, or the air-passages leading from the trachea to the lungs. (See *Bronchi*.) It is of



Bronchi and their Ramifications.

common occurrence, and may be either acute or chronic. Its symptoms are those of a feverish cold, such as headache, lassitude, and an occasional cough, which are succeeded by a more frequent cough occurring in paroxysms, expectoration of yellowish mucus, and feeling of great oppression on the chest. Slight attacks of acute bronchitis are frequent and not very dangerous. Acute bronchitis is often a formidable malady, and requires prompt treatment. Confirmed chronic bronchitis requires considerable medical treatment. Its main symptoms are cough, shortness of breath and expectoration. It is particularly apt to attack a person in winter; and in the end may cause death through the lungs becoming incapacitated for their work and through accompanying complications.

**Bronchocele** (bron'kō-sēl). See *Goiter*.

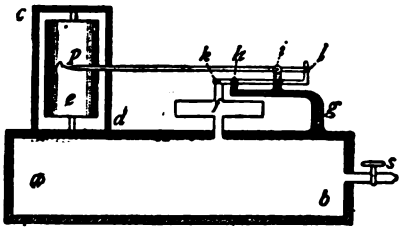
**Brongniart** (bron-nyär), ALEXANDRE, a French geologist and mineralogist, born in 1770; died in 1847. He was appointed in 1800 director of the porcelain manufactory at Sèvres. In 1807 appeared his *Traité Élémentaire de Minéralogie;* and with Cuvier he wrote *Description Géologique des Environs de Paris*. He also wrote other works on mineralogy and geology, and in 1844 appeared his *Traité des Arts Céramiques*. He was a member of the Academy of Sciences, and in 1822 succeeded Haüy as professor of mineralogy in the Museum of Natural History.—His son, ADOLPHE THEODORE BRONGNIART, born in 1801;

died in 1876; became professor of botany at the Jardin des Plantes, Paris, in 1833; and was the author of several botanical works held in high esteem.

**Bronte** (bron'tā), a town of Sicily, 22 miles N. N. W. of Catania, in a picturesque situation at the W. base of Mount Etna. Lord Nelson was created Duke of Bronte by the Neapolitan government in 1799. Pop. 20,366.

**Bronte** (bron'tē), CHARLOTTE (afterwards MRS. NICHOLLS), an English novelist, born at Thornton, in Yorkshire, 21st April, 1816; died at Haworth, 31st March, 1855. She was the third daughter of the Rev. Patrick Bronte, rector of Thornton, and afterwards of Haworth, a moorland village in the West Riding of Yorkshire, about 4 miles from Keighley. In 1842 Charlotte went with her sister Emily to Brussels, with the view of acquiring a knowledge of the French and German languages, and she subsequently taught for a year in the school she had attended there. In 1844 arrangements were entered into by her and her sisters Anne and Emily to open a school at Haworth, but from the want of success in obtaining pupils no progress was ever made with their scheme. They resolved now to turn their attention to literary composition; and in 1846 a volume of poems by the three sisters was published, under the names of Currer, Ellis, and Acton Bell. It was issued at their own risk, and attracted little attention, so they quitted poetry for prose fiction, and produced each a novel. Charlotte (Currer Bell) entitled her production *The Professor*, but it was everywhere refused by the publishing trade, and was not given to the world till after her death. Emily (Ellis Bell) with her tale of *Wuthering Heights*, and Anne (*Acton Bell*) with *Agnes Grey*, were more successful. Charlotte's failure, however, did not discourage her, and she composed the novel of *Jane Eyre*, which was published in October, 1847. Its success was immediate and decided, giving her an international reputation. Her second published novel, *Shirley*, appeared in 1849. Previous to this she had lost her two sisters, Emily dying on 19th Dec., 1848, and Anne on 28th May, 1849 (after publishing a second novel, the *Tenant of Wildfell Hall*). In the autumn of 1852 appeared Charlotte's third novel, *Villette*. Shortly after, she married her father's curate, the Rev. Arthur Bell Nicholls, but in nine months died of consumption. Her originally rejected tale of *The Professor* was published after her death, in 1857, and the same year a biography of her appeared from the pen of Mrs. Gaskell.

**Brontograph** (bron'tō-grâf), an apparatus devised by Marvin for recording any wave of sound,




MARVIN'S BRONTOGRAPH.

*a b*, large metallic box to which the frame *c d*, the rapidly revolving cylinder *e*, the aneroid box *f*, the post *g*, the pivots *h* and *i*, are firmly attached. The levers *k l* and *l p* cause the pen at *p* to make a magnified record of the motions of the pivot *k* attached to the upper movable surface of the aneroid box. The air within the box is first brought into equilibrium with the outside air by opening and closing the stopcock *s* just before an observation is to be made. A slow wave of compression and expansion causes the external air to contract and expand; the aneroid pivot *k*, and eventually the pen, follow these changes sluggishly but still approximately. Rapid or high-pitch sound-waves cannot be recorded by this brontograph.

such as thunder, or the report of a gun or cannon.

**Brontosaurus** (bron-tō-są'r u s), a gigantic reptilian animal, of the order Dinosauria, found fossil in secondary strata of the Rocky Mountains, having a long neck and tail, a very small head, and strong limbs.

**Bronze,** is an alloy of copper and tin, to which other metallic substances are sometimes added, especially

Vessels of the Bronze Period.

zinc. It is a fine-grained metal, taking a smooth and polished surface, harder

and more fusible than copper, but not so malleable. In various parts of the world weapons and implements were made of this alloy before iron came into use, and hence the *bronze age* is regarded as one coming between the *stone age* and the *iron age* of prehistoric archæology. (See *Archæology.*) Both in ancient and modern times it has been much used in making casts of all kinds, medals, bas-reliefs, statues, and other works of art; and varieties of it are also used for bells, gongs, reflectors of telescopes, cannon, etc. Its color is reddish, brownish, or olive-green, and is darkened by exposure to the atmosphere. Ancient bronze generally contains from 4 to 15 per cent of tin. The alloy of the present British bronze coinage consists of 95 parts of copper, 4 of tin, and 1 of zinc. An alloy of about 85 parts copper, 11 zinc, and 4 tin is used for statues. Bell-metal consists of 78 of copper and 22 of tin. An alloy called *phosphor bronze*, consisting of about 90 per cent. of copper, 9 of tin, and from 0.5 to 0.75 of phosphorus has been found to have peculiar advantages for certain purposes. The addition of phosphorus increases the homogeneousness of the compound, and by varying the proportion of the constituents the hardness, tenacity, and elasticity of the alloy may be modified at pleasure.—*Aluminium bronze* is an alloy of copper and aluminium, the metals being combined in different proportions according to the kind of bronze wanted. One variety is of a yellow or golden color, and is made into watch-chains and ornamental articles.—*Manganese bronze* is a bronze containing manganese and iron, and is said to possess remarkable properties in regard to strength, hardness, toughness, etc.—*Bronzing* is the operation of covering articles with a wash or coating to give them the appearance of bronze. Two kinds are common, the yellow and the red. The yellow is made of fine copper dust, the red of copper dust with a little pulverized red ocher. The fine green tint which bronze acquires by oxidization, called *patina antiqua*, is imitated by an application of sal ammoniac and salt or sorrel dissolved in vinegar. Recently bronze has been deposited on small statues and other articles with good effect by means of the electrolytic process.

**Bronze Age.** See *Bronze.*

**Bronze-wing,** a name for certain species of Australian pigeons, chiefly of the genus *Phaps*, distinguished by the bronze color of their plumage. The common bronze-winged ground-dove (*P. chalcoptĕra*) abounds in all the Australian colonies, and is a plump bird, often weighing a pound, much esteemed for table.

**Bronzing.** See *Bronze.*

**Brooch** (brōch), a kind of ornament worn on the dress, to which it is attached by a pin stuck through the fabric. They are usually of gold or silver, often worked in highly artistic patterns and set with precious stones. Brooches are of great antiquity, and were formerly worn by men as well as women, especially among the Celtic races. Among the Highlanders of Scotland there are preserved in several families ancient brooches of rich workmanship and highly ornamented. Some of them seem to have been used as a sort of amulet or talisman.

**Brooke** (brụk), HENRY, dramatist and novelist, the son of an Irish clergyman, was born in 1703; died in 1783. He was educated at Dublin University, and numbered Swift, Pope, and Garrick among his friends. In 1745 he was made barrack-master at Mullingar, and spent the rest of his life in literary work. He wrote many plays and novels, his chief novel being *The Fool of Quality.*

**Brooke,** SIR JAMES, celebrated as the Rajah of Sarawak, was born in Bengal in 1803, and died in Devonshire in 1868. In 1838, having gone to Borneo, he assisted the Sultan of Brunei (the nominal ruler of the island) in suppressing a revolt. For his services he was made Rajah and Governor of Sarawak, a district on the S. W. coast of the island, and being established in the government he endeavored to induce the Dyak natives to abandon their irregular and piratical mode of life and to turn themselves to agriculture and commerce; and his efforts to introduce civilization were crowned with wonderful success. He was made a K.C.B. in 1847.

**Brooke** (brụk), JOHN R., an American soldier, born in Pennsylvania in 1839. He enlisted in the army at the outbreak of the Civil war, and rose in rank by 1864 to brigadier-general of volunteers. In 1897 he was made major-general in the regular army and took part in the Porto Rico campaign of 1898, being afterwards made governor-general of that island and in Dec., 1898, governor-general of Cuba. He was placed on the retired list in 1902.

**Brook Farm,** a social community, formed on Fourier's principles of communism, 8 miles S. W. of Boston, organized in 1840 by George

Ripley, as an outcome of the Transcendental movement of that time. It was notable for the distinguished persons who were interested in it, including Emerson, Hawthorne, Alcott, Curtis, Dana, Margaret Fuller, and other prominent Bostonians. Business ability was lacking and the enterprise was abandoned in 1847. The romantic aspects of life in this community form the basis of Hawthorne's *Blithedale Romance.*

**Brookfield** (brụk'fēld), a city of Linn Co., Missouri, on Yellow Creek, 104 miles W. of Hannibal. Coal is mined in the vicinity, and it has ironworks, railroad machine shops, shoe factory and an active shipping trade in grain and live stock. Pop. 5749.

**Brookhaven,** a township (town), of Suffolk Co., Long Island N. Y., 58 miles E. of Brooklyn; a congregation of villages, chief among them Patchogue. Pop. 16,737.

**Brooklime** (brụk'lim; *Veronica Beccabunga*), a European plant, with blue flowers, common in ditches and wet places in Britain, a species of speedwell. It is sometimes used in salads.

**Brookline** (brụk'lin), a town of Norfolk Co., Massachusetts, in the close vicinity of Boston, with which it is connected by electric and steam railways; forming part of what is designated Greater Boston. Here are many elegant suburban residences, surrounded by beautiful grounds, its chief industry being the manufacture of electrical appliances. Pop. 27,792.

**Brooklyn** (brụk'lin), a former city, which on Jan. 1, 1898, became a part of New York city. It is situated on the west end of Long Island, separated from Manhattan by East River, a strait about three-quarters of a mile broad, crossed by steam-ferries and by four bridges and with railway tunnels beneath its bed. It has broad, straight streets, many of them planted with rows of trees, a river-front of nearly 9 miles, and covers an area of 16,000 acres. It is popularly known as the 'city of churches,' having about 300 of all denominations. Among the public buildings are the borough hall, of white marble, the jail, the county courthouse, the academy of music, etc. The literary and charitable institutions are very numerous. The Atlantic Dock is one of the largest in the States, covering 40 acres. The United States navy yard, on Wallabout Bay, occupies 45 acres. Brooklyn is a favorite residence of the wealthy New Yorkers. It has a large trade and numerous manufactures. Pop. (1900) 1,166,582; (1910) 1,678,776. See *New York.*

**Brooks** (brụks), CHARLES SHIRLEY, an English novelist and journalist, born in 1815; died in 1874. He wrote many plays and novels.

**Brooks,** PHILLIPS, bishop, was born in Boston, Massachusetts, in 1835, and became one of the most widely known clergymen of the American Protestant Episcopal Church. In England he received honorary degrees from both Oxford and Cambridge. He held rectorships in Philadelphia from 1859 to 1869, and in the latter year accepted a pastorate in Boston, where in 1891 he was elected Bishop of Massachusetts Diocese. He died Jan. 23, 1893.

**Brooks,** WILLIAM KEITH, naturalist, born at Cleveland, Ohio, in 1848. In 1876 he became an associate of Johns Hopkins University and in 1878 director of its marine laboratory. His works include *Handbook of Marine Zoology, Heredity, The Oyster in Maryland,* etc.

**Broom,** a popular name which includes several allied genera of plants of the natural order Leguminosæ and of the suborder Papilionaceæ, plants distinguished by a leguminous fruit and papilionaceous flowers. The common broom of Europe (*Cytisus scopārius*) is a bushy shrub with straight angular branches, of a dark-green color, deciduous leaves, and flowers of a deep golden yellow. Its twigs are often made into brooms, and are used as thatch for houses and corn-stacks. They have also been used for tanning. The whole plant has a very bitter taste, and a decoction of it is diuretic, in strong doses emetic.—*White broom* or *Portugal broom* (*C. albus*) has beautiful white flowers.—*Spanish broom* or *spart* (*Spartium junceum*) is an ornamental flowering shrub growing in Africa, Spain, Italy, and the S. of France, and often cultivated in English gardens. It has upright, round branches, that flower at the top, and spear-shaped leaves. Its fiber is made into various textile fabrics, and is also used in paper-making.—*Dyer's broom* (*Genista tinctoria*) yields a yellow color used in dyeing.—*Butcher's broom* is *Ruscus aculeātus,* an evergreen shrub of the order Liliaceæ, and therefore entirely different from the brooms proper.

**Broom-corn, Broom-grass** (*Sorghum vulgāre,* millet or Guinea corn), a plant of the order of grasses, with a jointed stem, rising to the height of 8 or 10 feet, extensively cultivated in N. America,

where the branched panicles are made into carpet-brooms and clothes-brushes. The seed is used for feeding poultry, cattle, etc.

**Brother Jonathan,** a popular term applied to the people of the United States, as 'John Bull' is to the people of England. It has the following origin: Washington, on assuming command of the New England revolutionary forces, was in great straits for arms and war material. The governor of Connecticut, Jonathan Trumbull, was a man of excellent judgment and an esteemed friend of Washington. In the emergency Washington said 'we must consult Brother Jonathan.' This expression was repeated on other serious occasions, and became a convenient name for the whole people.

**Brothers** (bruth'ers), a term applied to the members of monastic and military orders as being united in one family. *Lay brothers* were an inferior class of monks employed in monasteries as servants. Though not in holy orders, they were bound by monastic rules.

**Brothers,** Richard, an English fanatic and self-styled prophet, born about 1760; died in 1824. He served as lieutenant in the army, which he quitted in 1789, refusing from conscientious scruples to take the oath necessary to entitle him to his half-pay. He announced himself in 1793 as the apostle of a new religion, dating his call from 1790. He styled himself the 'Nephew of the Almighty, and Prince of the Hebrews, appointed to lead them to the land of Canaan.' He published in 1794 *A Revealed Knowledge of the Prophecies and Times*, in two books. He was committed to Newgate for prophesying the death of the king, and subsequently to Bedlam as a dangerous lunatic, but was released in 1806.

**Brougham** (bröm or brō'ėm), a close four-wheeled carriage, with a single inside seat for two persons, glazed in front and with a raised driver's seat, named after and apparently invented by Lord Brougham.

**Brougham** (bröm or brō'ėm), Henry, Baron Brougham and Vaux, was born at Edinburgh 19th September, 1778; died at Cannes 7th May, 1868. He was educated at Edinburgh, studied law there, and was admitted a member of the Society of Advocates in 1800. Along with Jeffrey, Horner, and Sydney Smith he bore a chief part in the starting of the *Edinburgh Review* in 1802, to which he contributed a great number of articles. Finding Edinburgh too circumscribed a field for his abilities, he removed to London, and in 1808 was called to the English bar. In 1810 he entered Parliament as member for the borough of Camelford, joined the Whig party, which was in opposition, and soon after obtained the passing of a measure making

Lord Brougham.

the slave trade a felony. From 1812 until 1816 he remained without a seat, when he was returned for Winchelsea. He represented this borough up to 1830. On his return to parliament he at once began an agitation for social, political, and especially educational reform. In 1825 he was elected Lord Rector of Glasgow University, and also introduced a bill into parliament for the incorporation of the London University, of which he may be considered one of the chief founders. He also bore an active part in establishing the Society for the Diffusion of Useful Knowledge in 1827. Meantime his reputation as a brilliant speaker and able barrister had been gradually increasing, and his fearless and successful defense of Queen Caroline in 1820 and 1821 placed him on the pinnacle of popular favor. At the general election of 1830 he was returned for the large and important county of York. In the ministry of Earl Grey he accepted the post of lord-chancellor, and was raised to the peerage (22d Nov., 1830) with the title of Baron Brougham and Vaux. In this post he distinguished himself as a law reformer, and aided greatly in the passing of the Reform Bill of 1832. In 1834 the Whig ministry was dismissed, and this proved the end of his official life, as he was never afterwards a

member of any ministry, though for years he continued an active member of the House of Lords. Lord Brougham accomplished a large amount of literary work, contributing to newspapers, reviews, and encyclopedias, besides writing several independent works; and he had no mean reputation in mathematics and physical science. His works, collected by himself, and published in eleven vols. (1857–60), include biographical, political, rhetorical and other productions, to which he added an autobiography published posthumously under the title: *Life and Times of Henry, Lord Brougham.*

**Brougham,** JOHN, actor and dramatist; born at Dublin in 1810; died at New York in 1880. He wrote upwards of a hundred pieces, including *The Game of Life, Romance and Reality, Love's Livery, The Duke's Motto,* etc., and contributed largely to periodicals. He was well known as an actor both in England and in America.

**Broughton** (brou'tun), JOHN CAM HOBHOUSE, LORD, English writer and statesman; born in 1786; died in 1869. He was the son of Sir Benjamin Hobhouse, and was an intimate friend of Lord Byron, whom he accompanied in his travels to Greece and Turkey in 1809. He published in 1812 *Journeys into Albanian and other Provinces of the Turkish Empire.* He also accompanied Byron to Italy in 1816–17, and wrote *Historical Illustrations of the Fourth Canto of Childe Harold.* In 1816 he published *Letters on the Hundred Days, or Last Reign of Napoleon.* He entered parliament in 1819 as member for Westminster. In 1832 he entered Lord Melbourne's ministry as secretary of war and became a privy-councilor. In 1833 he was made chief secretary for Ireland, and in 1835 he was appointed president of the board of control. He held this office till Sept., 1841, and in Lord Russell's administration, 1846–52. He was raised to the peerage as Baron Broughton in 1851.

**Broughton,** RHODA, novelist, born in Wales in 1840. Among her works are *Red as a Rose is She, Second Thoughts, Dr. Cupid,* etc.

**Broughty-Ferry** (brą'ti), a town of Scotland, County Forfar, N. shore of the estuary of the Tay, 3 miles E. Dundee, so called from a ferry across the Tay to Ferry-port-on-Craig, in Fifeshire. Here are many mansions belonging to the merchants and manufacturers of Dundee, and it is resorted to as a bathing-place. At the east end of the town is the old castle of Broughty, with guns, etc., for the defense of the Tay. Pop. 10,484.

**Broussa** (brös'ä). See *Brusa.*

**Broussais** (brö-sä), FRANÇOIS JOSEPH VICTOR, a French physician, born in 1772; died in 1838. He is regarded as the founder of what was called the physiological system of medicine. According to his theory, irritability is the fundamental property of all living animal tissues, and every malady proceeds from an undue increase or diminution of that property.

**Broussonet** (brö-so-nā), PIERRE MARIE AUGUSTE, a French naturalist, born in 1761; died in 1807. He lived for some time in England, and was a friend of Sir Joseph Banks. He published *Ichthyologia,* and *Memoirs towards the History of the Respiration of Fishes.* He was professor of botany at Montpellier, and a member of the Academy of Sciences.

**Broussonetia** (brö-so-nē'ti-a), a genus of trees, nat. order Moraceæ, or mulberries, the paper-mulberry. See *Mulberry.*

**Brouwer** (brou'ver), or BRAUWER, ADRIAAN, a Dutch painter, born in 1608; died in 1640. He was a pupil of Franz Hals, and was patronized by Rubens; but was of very dissipated habits. His works are chiefly tavern scenes and other delineations of low life, and rank among the best of their kind.

**Brown** (broun), a color which may be regarded as a mixture of red and black, or of red, black and yellow. There are various brown pigments, mostly of mineral origin, as bistre, umber, cappagh brown, etc.

**Brown,** CHARLES BROCKDEN, one of the earliest able American novelists, was born in Philadelphia in 1771; died 1810. He was destined for the law, but the term intended for preparatory legal study was principally occupied with literary pursuits. His novel *Wieland, or the Transformation,* was published in 1798; *Ormond, or the Secret Witness,* in 1799; and *Arthur Mervyn* in 1800. In the last-named work the ravages of the yellow fever, which the author had witnessed in New York and Philadelphia, are painted with horrifying detail. He was originator of the *Monthly Magazine and American Review* (1799-1800). He also founded in 1805 the *Literary Magazine and American Register,* which he edited for five years. Among his other works are *Clara Howard* (1801) and *Jane Talbot* (1804).

**Brown,** FORD MADOX, an English painter, grandson of Dr. John

**Brown**, of Edinburgh, the author of the Brunonian system of medicine (born 1821; died 1893). In 1844 and 1845 he contributed (unsuccessfully) cartoons of the *Finding of the Body of Harold, Justice*, and other subjects to the competitive exhibition for the frescoes of the houses of parliament. Among his principal works are: *King Lear; Chaucer at the Court of Edward III; The Last of England; Work; Cordelia's Portion;* the Manchester townhall frescoes, etc. He is generally rated as a pre-Raphaelite, but though a close intimacy existed between him and the brotherhood, he never actually joined them.—His son, OLIVER MADOX BROWN (born 1855, died 1874), from early boyhood showed remarkable capacity both in painting and literature, especially prose fiction and poetry. His *Literary Remains* were published in 1876.

**Brown,** GEORGE, a Canadian journalist and politician, born in Edinburgh, Scotland, in 1818, and educated at the high school there. He emigrated to the United States with his father, and assisted in the management of a newspaper at New York; but in 1843 removed to Toronto, Canada, where he founded a newspaper, *The Globe*, which was very successful. In 1852 he was returned to Parliament, and rapidly rose to the first rank as a debater and advocate of reforms. In 1858 he was called to the

George Brown.

office of premier, and formed an administration, which, however, owing to an adverse vote of the assembly, lasted only three days. In 1864 he joined the coalition government as leader in the reform section, was called to the senate in 1873, and the year after went to Washington along with Sir Edward Thornton to negotiate a commercial treaty with the United States. He died on May 9, 1880, of a gunshot wound inflicted by a discharged employee. Mr. Brown, though perhaps wanting in some of the qualities which make a successful parliamentary leader, was a great personal force in Canadian politics, and contributed powerfully to the cause of reform.

**Brown,** SIR GEORGE, a distinguished British general, born near Elgin in 1790; died in 1865; served in the Peninsular war, and in the American campaign of 1814. He became lieutenant-general in 1851; and distinguished himself in the Crimean war at Alma, Inkerman, and Sebastopol. Was made K.C.B. in 1855.

**Brown,** JOHN, a Scottish covenanting martyr, born about 1627; killed in 1685. He is said to have fought against the government at Bothwell Bridge in 1679, and to have been on intimate terms with the leaders of the persecuted party. He was shot by Claverhouse and a party of his dragoons at Priestfield or Priesthill in the upland parish of Muirkirk, Ayrshire, where he cultivated a small piece of ground and acted as a carrier.

**Brown,** JOHN, a Scottish divine, minister in the Burgher dissenting body at Haddington, born in 1722; died in 1787. By intense application to study he became acquainted with the French, Italian, German, Arabic, Persian, Syriac, and Ethiopic languages, as well as the Greek and Hebrew. His most important works are: *The Self-interpreting Bible; Dictionary of the Bible; General History of the Church; Harmony of Scripture Prophecies*, etc.

**Brown,** JOHN, a Scottish divine, grandson of the preceding, born in 1784; died in 1858. He was ordained pastor of the Burgher congregation at Biggar in 1806. In 1821 he removed to Edinburgh; and in 1834 became professor of theology in connection with the body to which he belonged, afterwards merged in the United Presbyterian Church. He was author of numerous works chiefly in Biblical criticism, some of which were very popular.

**Brown,** JOHN, author of the Brunonian system in medicine, was born in Berwickshire in 1735; died at London in 1788. After studying medicine at the Edinburgh University he took the degree of Doctor in Medicine at St. Andrews, and after practising and teaching in Edinburgh he published his *Elements of Medicine* (in Latin). He maintained that the majority of diseases were proofs of weakness and not of excessive strength or excitement, and therefore contended that indiscriminate lowering of the system, as by bleeding, was erroneous, and that supporting treat-

ment was required. His system gave rise to much opposition, but his opinions materially influenced the practice of his professional successors. Having fallen into difficulties, he removed to London in 1786.

**Brown,** JOHN, physician and essayist, son of the preceding, born at Biggar in 1810; died at Edinburgh in 1882. He graduated M.D. in 1833 and began practice as a physician. His leisure hours were devoted to literature, many of his contributions appearing in the *North British Review*, *Good Words*, and other periodicals. His collected writings were published under the title of *Horæ Subsecivæ* (leisure hours), and embrace papers bearing on medicine, art, poetry, and human life generally. Several of his sketches (such as *Rab and his Friends*, *Our Dogs*, *Pet Marjory*, *Jeems the Doorkeeper*) on which his fame chiefly rests, have been published separately. Humor, tenderness, and pathos are his chief characteristics.

**Brown,** JOHN, an opponent of slavery, born at Torrington, Connecticut in 1800. He early conceived a hatred for slavery, and having removed to Osawatomie, Kansas, in 1855, he took an active part against the proslavery party in the struggle for the possession of the territory that ensued. In the summer of 1859 he rented a farmhouse about six miles from Harper's Ferry, and organized a plot to liberate the slaves of Virginia. On October 16, with the aid of about twenty friends, he surprised and captured the arsenal at Harper's Ferry, but was wounded and taken prisoner by the Virginia militia next day, tried, and executed at Charlestown, December 2. This event was prominent among the warlike issues of the time, some of the antislavery party regarding John Brown as a martyr to their cause.

**Brown** (or BROWNE), ROBERT, founder of an English religious sect first called *Brownists*, and afterwards *Independents*, was born about 1540, and studied at Cambridge, where in 1580, he began openly to attack the government and liturgy of the Church of England as anti-Christian. After attacking the established church for years he was excommunicated, but was reinstated, and held a church living for over forty years, dying in 1633. The sect of Brownists, far from expiring with their founder, soon spread, and a bill was brought into parliament which inflicted on them very severe pains and penalties. In process of time, however, the name Brownists was merged in that of Congregationalists or Independents.

**Brown,** ROBERT, botanist, born at Montrose, Scotland, in December, 1773; died at London 10th June, 1858; was the son of a Scotch Episcopalian clergyman. He received his education at Marischal College, Aberdeen, and afterwards studied medicine at Edinburgh. In 1800 he was appointed naturalist to Flinders' surveying expedition to Australia. He returned with nearly 4000 species of plants, and was shortly after appointed librarian to the Linnæan Society. In 1810 he published the first volume of his great work *Prodromus Floræ Novæ Hollandiæ et Insulæ Van Diemen*. No second volume of it ever appeared. He was the first English writer on botany who adopted the natural system of classification, which has since entirely superseded that of Linnæus. In 1814 he published a botanical appendix to Flinders' account of his voyage, and in 1828 *A Brief Account of Microscopical Observations on the Particles contained in the Pollen of Plants, and on the General Existence of Active Molecules in Organic and Inorganic Bodies*. He also wrote botanical appendixes for the voyages of Ross and Parry, the African exploration of Denham and Clapperton and others, and described, with Dr. Bennet, the plants collected by Dr. Horsfield in Java. In 1810 he received the charge of the collections and library of Sir Joseph Banks. He transferred them in 1827 to the British Museum, and was appointed keeper of botany in that institution. He became a fellow of the Royal Society in 1811, D.C.L. Oxford in 1832, a foreign associate of the French Academy of Sciences in 1833. He had the Copley medal in 1839, and was appointed president of the Linnæan Society in 1849. As a naturalist Brown occupied the very highest rank among men of science. A collection of his miscellaneous writings has been published by the Ray Society (1866–67).

**Brown,** THOMAS, poet and miscellaneous writer, described by Addison as 'of facetious memory,' born at Shifnal, Shropshire, in 1663; died at London in 1704. He was the author of numerous dialogues, letters, poems, etc., witty, coarse, and indelicate, first collected in 1707.

**Brown,** THOMAS, a Scotch metaphysician, was born at Kirkmabreck, Kirkcudbright, in 1778; died at Brompton, London, in 1820. He was educated at the High School, and subsequently at the University of Edinburgh, where he obtained the professorship of moral philosophy. He distinguished himself, at a very early age by an acute

review of the medical and physiological theories of Dr. Darwin, in a work entitled *Observations on Darwin's Zoonomia*. He published some indifferent poems which were collected in 1820. But he chiefly deserves notice on account of his metaphysical speculations, his chief work being *Lectures on the Philosophy of the Human Mind*, 1822. His system reduces the intellectual faculties to three great classes—perception, simple suggestion, and relative suggestion; employing the term suggestion as nearly synonymous with association. He held original views in regard to the part played by touch and the muscular sense in relation to belief in an external world. His development of the theory of cause and effect was first suggested by Hume.

**Brown Bess,** a name familiarly given to the old government regulation bronzed flint-lock musket formerly used in the British army.

**Brown Bread.** See *Bread*.

**Brown Coal,** a variety of *Lignite* (which see).

**Browne** (brown), CHARLES FARRAR, an American humorist, best known as 'Artemus Ward,' was born at Waterford, Maine, in 1834; died at Southampton, England, in 1867. Originally a printer, he became editor of papers in Ohio, where his humorous letters became very popular. He subsequently lectured on California and Utah in the States and in England, where he contributed to *Punch*. His writings consist of letters and papers by 'Artemus Ward,' a pretended exhibitor of wax figures and wild beasts, and are full of drollery and eccentricity.

**Browne,** HABLOT KNIGHT, an English designer of humorous and satirical subjects, and an etcher of considerable skill, better known by the pseudonym of 'Phiz,' born at Kennington, Surrey, 1815; died at Brighton 1882. In 1835 he succeeded Seymour as the illustrator of Dickens' *Pickwick*, and was afterwards engaged to illustrate *Nicholas Nickleby, Dombey and Son, Martin Chuzzlewit, David Copperfield*, and other works of that author. He also illustrated the novels of Lever, Ainsworth, et al., besides sending many comic sketches to the illustrated serials of the time.

**Browne,** ISAAC HAWKINS, an English poet, born at Burton-on-Trent in 1706; died in 1760. Author of *Design and Beauty; The Pipe of Tobacco* (in which he imitates Pope, Young, Swift, and others); and a Latin Poem, *De Animi Immortalitate*, modeled on Lucretius and Virgil.

**Browne,** SIR THOMAS, an English physician and writer, was born at London in 1605; died at Norwich in 1682. He was educated at Winchester School and Oxford, where he took the degree of M.A. He practised as a physician for some time in Oxfordshire. He subsequently visited the continent of Europe and received the degree of M.D. at Leyden. On his return to England he settled as a physician at Norwich, where he married and acquired an extensive practice and high reputation. In 1642 was published his *Religio Medici* ('A Physician's Religion'), which excited the attention of the learned, not only in England but throughout Europe, gave rise to doubts of the author's orthodoxy, and was translated into various languages. In 1646 his literary reputation was still further heightened by the appearance of his *Pseudodoxia Epidemica, or Treatise on Vulgar Errors*, a work of extraordinary learning, and accounted the most solid and useful of his literary labors. In 1658 his *Hydriotaphia*, or *Treatise on Urn-Burial*, appeared conjointly with his *Garden of Cyrus*, a work treating of horticulture from Adam's time to that of Cyrus. These works ranked him very high as an antiquary; and he maintained a wide correspondence with the learned both at home and abroad. In 1665 he was constituted an honorary member of the College of Physicians, and in 1671 Charles II, visiting Norwich, conferred on him the honor of knighthood. Of a most amiable private character, he was happy in the affection of his large family and numerous friends; and passed through a remarkably tranquil and prosperous literary and professional life. Though he wrote exposing vulgar errors, he was himself a believer in alchemy, astrology, and witchcraft.

**Browne,** WILLIAM, an English poet, born at Tavistock, Devonshire in 1591; died about 1645. In his twenty-third year he published his *Britannia's Pastorals*, which met with great approbation; and in the following year appeared his *Shepherd's Pipe*, in seven eclogues. In 1616 he published the second part of his *Britannia's Pastorals*, which met with equal success with the former. Browne was tutor to Robert Dormer, earl of Caernarvon, who was killed at the battle of Newbury, and filled a similar office in the family of the Earl of Pembroke.

**Browne,** WILLIAM G., an English traveler in Africa and Asia;

born at London in 1768; killed by robbers in Persia in 1813. He visited the African kingdoms of Darfur and Bornou in 1791, and was the first who made those countries known to Europeans. He published in 1799 *Travels in Africa, Egypt, and Assyria, from 1792 to 1798.*

**Brown Holland,** an unbleached linen used for various articles of clothing and upholstery.

**Brownie** (brou'ni), in Scotland, an imaginary spirit formerly believed to haunt houses, particularly farmhouses. Instead of doing any injury he was believed to be very useful to the family, particularly to the servants if they treated him well, for whom he was wont to do many pieces of drudgery while they slept. The brownie bears a close resemblance to the Robin Goodfellow of England, and the *Kobold* of Germany.

**Brown'ian** MOVEMENTS, the incessant activity manifested by small solid particles suspended in water, when observed under the microscope. This phenomenon was first observed by Robert Brown, the botanist (*q. v.*). Its cause is unknown. It is a vibratory movement, different from the movement of translation shown by organic germs.

**Browning** (broun'ing), ELIZABETH BARRETT, poetess; born at Durham, England, in 1806; died at Florence, June 30, 1861. Her father, Edward Moulton, took the name of Barrett on succeeding to some property. She grew up at Hope End, near Ledbury, Herefordshire, where her father possessed a large estate. Her bodily frame was from the first extremely delicate, and she had been injured by a fall from her pony when a girl, but her mind was sound and vigorous, and disciplined by a course of severe and exalted study. She early began to commit her thoughts to writing, and in 1826 a volume, entitled *An Essay on Mind, with other Poems*, appeared of her authorship. A money catastrophe compelled her father to settle in London, and her continued delicacy received a severe shock by the accidental drowning of her brother, causing her to pass years in the confinement of a sickroom. Her health was at length partially restored, and in 1846 she was married to Mr. Robert Browning, soon after which they settled in Italy, and continued to reside for the most part in the city of Florence. Her *Prometheus Bound* (from the Greek of Æschylus) and *Miscellaneous Poems* appeared in 1833; the *Seraphim and other Poems* in 1838. In 1856 a collected edition of Mrs. Browning's works appeared, including several new poems, and among these *Lady Geraldine's Courtship. Casa Guidi Windows*, a poem on the struggles of the Italians for liberty in 1848–49, appeared in 1851. The longest and most finished of all her works, *Aurora Leigh*, a narrative and didactic poem in nine books, was published in 1857. *Poems before Congress*, appeared in 1860, and two posthumous volumes: *Last Poems*, 1862, and *The Greek Christian Poems and the English Poets* (prose essays and translations), 1863, were edited by her husband.

**Browning,** ROBERT, poet, born at Camberwell, Surrey, in 1812; died Dec. 12, 1889. He was educated at University College, London, after which he went to Italy, where he made diligent study of its mediæval history and the life of the people. In 1846 he married Elizabeth Barrett (see above), and afterwards resided chiefly in Italy, making occasional visits to England. His first poem, *Pauline*, was published in 1833; followed by *Paracelsus* in 1835; *Stafford, a Tragedy* (1837), produced at Covent Garden, Macready and Helen Faucit playing the chief parts. *Sordello* appeared in 1840, followed by the series called *Bells and Pomegranates*, including the three plays *Pippa Passes, King Victor and King Charles*, and *Colombe's Birthday;* four tragedies: *The Return of the Druses, A Blot on the Scutcheon, Luria*, and *The Soul's Tragedy;* and a number of *Dramatic Lyrics*, among them the well-known *Pied Piper of Hamelin*, and *How they Brought the Good News from Ghent to Aix* (1841–46). Between 1846 and 1868 appeared *Men and Women; Christmas Eve and Easter Day; Dramatis Personæ*, and some shorter poems. *The Ring and the Book* (1869), his longest poem, was followed by *Balaustion's Adventure;* and *Prince Hohenstiel-Schwangau* (1871); *Fifine at the Fair* (1872); *Red Cotton Nightcap Country* (1873); *Aristophanes' Apology; Inn Album* (1875); *Pacchiarotto* (1876); *La Saisiaz* (1878); *Dramatic Idylls* (1879–80); *Jocoseria* (1883); *Ferishtah's Fancies* (1884); and *Parleyings with certain People of Importance in their Day* (1887). Browning received the degree of D.C.L. from Oxford in 1882. Browning Societies have been formed in England and the United States for the study of his works, his poems being often difficult to understand from the quick transitions of thought, and not infrequently rugged and harsh in expression. Yet they are

among the chief poetic utterances of the century.

**Brownists,** the name given for some time to those who were afterwards known as Independents, so called from Robert Brown.

**Brownlow** (broun'lō), WILLIAM GANNAWAY, born in Virginia in 1805; died in 1877; was for ten years an itinerant Methodist preacher. As editor of the *Knoxville Whig* his bold and quaint utterances gave him a wide reputation. In the secession he clung to the Union, was arrested by the Confederate government and sent out of their lines. In 1865 he was elected governor of Tennessee, and in 1869 United States senator. He was an ardent, fearless advocate of any cause he espoused.

**Brownspar,** a name often given by mineralogists to certain varieties of dolomite, from their brownish color. They are also sometimes called *pearlspar*, from their pearly luster.

**Brownsville** (brouns'vil), a city, county seat of Cameron Co., Texas; the metropolis and commercial center of the Rio Grande Valley, and a gateway to Mexico. It has a large sugar industry, cotton-seed oil mill, etc. Pop. 10,517.

**Brown University,** an educational institution at Providence, Rhode Island, founded 1764. It has a valuable library of 170,000 vols., a teaching faculty of about 100, and 1000 students. Its productive funds amount to $3,500,000. Johann Nicholas Brown, merchant of Rhode Island, largely endowed it, and its name in consequence was changed from Rhode Island College to its present title.

**Bruce** (brūs), a family name distinguished in the history of Scotland. See the articles below.

**Bruce,** DAVID. See *David II.*

**Bruce,** EDWARD, a brother of Robert I, who, after distinguishing himself in the war of independence, crossed in 1315 to Ireland to aid the native septs against the English. After many successes he was crowned king of Ireland at Carrickfergus, but fell in battle near Dundalk in 1318.

**Bruce,** JAMES, an African traveler, born at Kinnaird House, Stirlingshire, Scotland, in 1730. He received his education at Harrow and at the University of Edinburgh, and entered the wine trade, but having inherited his father's estate in 1758 he soon gave up business. From 1763 to 1765 he held the consulship of Algiers, and in 1765 he visited successively Tunis, Tripoli, Rhodes, Cyprus, Syria, and several parts of Asia Minor, where he made drawings of the ruins of Palmyra, Baalbec, etc. In 1768 he set out for Cairo, navigated the Nile to Syene, crossed the desert to the Red Sea, passed some months in Arabia Felix, and reached Gondar, the capital of Abyssinia, in 1770. In that country he ingratiated himself with the sovereign and other influential persons, and in the same year succeeded in reaching the sources of the Abai, then considered the main stream of the Nile. On his return to Gondar he found the country engaged in a civil war, and more than three years elapsed before he was able to return to Cairo. After visiting France and Italy he returned to Scotland in 1774. His long-expected *Travels* did not appear until 1790, and were received with some incredulity, though succeeding travelers have proved them in large part accurate. Bruce lost his life by an accidental fall down stairs in 1794.

**Bruce,** MICHAEL, a Scottish poet, born at Kinnesswood, Kinross-shire, in 1746. At first a herd-boy, he succeeded in attending Edinburgh University, occupying himself in the intervals as a village schoolmaster. The struggle against poverty brought on consumption, and he died in 1767. His poems, of which the best known is the *Elegy* on his own approaching death, were published by the Rev. John Logan in 1770. This volume contained a well-known ode to the cuckoo which Logan afterwards claimed as his own, though he really seems only to have somewhat improved Bruce's poem.

**Bruce,** ROBERT (ROBERT DE BRUS), fifth Lord of Annandale, born 1210; died at Lochmaben Castle 1295. He was possessed of extensive estates in Cumberland, of which he was made sheriff in 1255. He was one of the fifteen regents of Scotland during the minority of Alexander III. and was one of the competitors for the Scottish crown on the death of Margaret, the Maiden of Norway, in 1290; Bruce being the grandson of David, Earl of Huntingdon, by his second daughter Isobel, while Baliol claimed as the great-grandson of the eldest daughter Margaret. On the decision of Edward being given in 1292 in favor of Baliol, Bruce resigned the estate of Annandale to his eldest son to avoid doing homage to his rival.

**Bruce,** ROBERT, Earl of Carrick, eldest son of the preceding, accompanied Edward I to Palestine in 1269; married, in 1271, Martha Margaret, Countess of Carrick. Like his father, he resigned the lordship of An-

nandale to his eldest son to avoid acknowledging the supremacy of Baliol. On the revolt of the latter Bruce fought on the English side, and after the battle of Dunbar made an unsuccessful application to Edward for the crown. He died in 1304.

**Bruce,** ROBERT, the greatest of the kings of Scotland, was born in 1274, the son of the preceding. In 1296, as Earl of Carrick, he swore fealty to Edward I, and in 1297 fought on the English side against Wallace. He then joined the Scottish army, but in the same year returned to his allegiance to Edward until 1298, when he again joined the national party, and became in 1299 one of the four regents of the kingdom. In the three final campaigns, however, he resumed his fidelity to Edward, and resided for some time at his court; but, learning that the king meditated putting him to death on information given by the traitor Comyn, he fled in Feb., 1306, to Scotland, stabbed Comyn in a quarrel at Dumfries, assembled his vassals at Lochmaben Castle, and claimed the crown, which he received at Scone, March 27. Being twice defeated, he dismissed his troops, retired to Rathlin Island, and was supposed to be dead, when, in the spring of 1307, he landed on the Carrick coast, defeated the Earl of Pembroke at Loudon Hill, and in two years had wrested nearly the whole country from the English. He then in successive years advanced into England, laying waste the country; and on June 24, 1314, defeated in a famous battle at Bannockburn the English forces advancing under Edward II to the relief of the garrison at Stirling. In 1316 he went to Ireland to the aid of his brother Edward, and on his return in 1318, in retaliation for inroads made during his absence, he took Berwick and harried Northumberland and Yorkshire. Hostilities continued until the defeat of Edward near Byland Abbey in 1323, and though in that year a truce was concluded for thirteen years, it was speedily broken. Not until March 4, 1328, was the treaty concluded by which the independence of Scotland was fully recognized. Bruce did not long survive the completion of his work, dying at Cardross Castle on June 7, 1329. He was twice married; first to a daughter of the Earl of Mar, Isabella, by whom he had a daughter, Marjory, mother of Robert II; and then to a daughter of Aymer de Burgh, Earl of Ulster, Elizabeth, by whom he had a son, David, who succeeded him.

**Bruchsal** (brŭh'zâl), a town of Baden, 25 miles S. of Heidelberg. It was the residence of the prince-bishops of Spires from the 11th century, but lost its importance until it became a considerable railway center. The Grand-duke of Baden has a fine palace here. Pop. 13,567.

**Brucine** (brö'sin or brö'sin), an alkaloid accompanying strychnine in nux vomica. Its taste is exceedingly bitter and acrid, and its action on the animal economy is entirely analogous to that of strychnine, but much less powerful.

**Brueys-d'Aigalliers** (brü-ā-dā-gāl-yā), FRANÇOIS-PAUL, a French admiral, born at Uzes 1753, became captain in 1792, and vice-admiral in 1798. He successfully conveyed Bonaparte and his army to Egypt in 1798, but was killed in the subsequent naval battle in the Bay of Aboukir shortly before his ship, the *Orient*, blew up.

**Bruges** (brüzh; Flemish *Brugge*, that is, Bridges), an old walled city of Belgium, capital of West Flanders, 57 miles N. W. of Brussels, on the railway to Ostend. It is an important canal center, and has over fifty bridges, all opening in the middle for the passage of vessels. The principal canals are those to Sluis, Ghent, and Ostend, on all of which fairly large vessels can come up to Bruges. In the 13th and 14th centuries it was one of the chief commercial places in Europe, and an important member of the Hanseatic League. Towards the end of the 15th century it began to decline, but still carries on a considerable trade with the north of Europe, and is by its canals an entrepôt of Belgian commerce. Among its more noteworthy buildings are the Halles (containing cloth and other halls or markets), a fine old building, with a tower 354 feet high, in which is a numerous set of chimes; the Hotel de Ville, the Bourse, and the Palace of Justice; the Church of Nôtre Dame, with its elevated spire and splendid tombs of Charles the Bold and Mary of Burgundy; etc. The town possesses interesting works of art by Jan Van Eyck, Memling, the Van Oosts, etc. Textile goods, lace, etc., are manufactured. Pop. 53,728.

**Brugsch** (brugsh), HEINRICH KARL, a German Egyptologist, born in 1827. He early devoted himself to the study of Egyptian antiquities, and resided a number of years in Egypt, being for some time in the employment of the Egyptian government, by which he was created a bey, and latterly a pasha. Brugsch also traveled in various parts of the East. His works are very numer-

ous. His *History of Egypt from the Monuments*, has been translated into English. Died 1894.

**Brühl** (brül), HEINRICH, COUNT VON, minister and favorite of Augustus III, King of Poland, born in 1700; died 1763. In 1747 he became the prime-minister of Augustus, to gratify whose wishes he exhausted the state, plunged the country into debt, and greatly reduced the army. He acquired great wealth and lived in greater state than the king himself. His profusion was often beneficial to the arts and sciences, and his library of 62,000 vols. forms a chief part of the Royal Library at Dresden.

**Brumaire** (brü-mär; L. *bruma*, winter), the second month in the calendar adopted by the first French republic, beginning on the 23d of October and ending 21st November. The 18th Brumaire of the year VIII of the French Revolution (Nov. 9, 1799) witnessed the overthrow of the Directory by Bonaparte.

**Brumbaugh** (brum'bą), MARTIN GROVE, American educator and statesman, born April 14, 1862 in Huntingdon County, Pennsylvania. He was educated at Juniata College; took a master's degree at the University of Pennsylvania in 1894 and a doctor's degree in 1895. He was county superintendent of schools in Huntingdon County, president of Juniata College, professor of pedagogy in the University of Pennsylvania, and 1906–1914, superintendent of schools in Philadelphia. In 1914 he was elected governor of Pennsylvania on the Republican ticket.

**Brummell** (brum'mel), GEORGE BRYAN (*Beau Brummel*), son of a clerk in the Treasury, born in London in 1778. He was educated at Eton and at Oxford, and at the age of sixteen made the acquaintance of the Prince of Wales, afterwards George IV, who gave him a commission in his own regiment. He left the service in 1798 and inherited a fortune of £30,000, which he expended in a course of sumptuous living, during which his *dicta* on matters of etiquette and dress were received in the *beau monde* as indisputable. His creditors at length became clamorous, and in 1816 he took refuge in Calais. Subsequently (1830) he was appointed consul at Caen, but on the abolition of the post was reduced to poverty, and died in a lunatic asylum in 1840.

**Brunanburgh** (brun'a-burg), the scene of a battle in which Athelstan and the Anglo-Saxons defeated a force of Scots, Danes, etc., in 937: locality very doubtful.

**Brunck** (brųnk) RICHARD FRANÇOIS PHILLIPPE, a classical commentator, born at Strasburg in 1729; died there in 1803. He published valuable editions of Virgil, Apollonius Rhodius, Aristophanes, the Gnomic poets, Plautus, Terence, and Sophocles.

**Brune** (brün), GUILLAUME MARIE ANNE, marshal of France, son of a lawyer at Brives-la-Gaillarde, born in 1763. In 1793 he joined the army; in 1799 he compelled the British and Russians to evacuate the north of Holland. In 1800 he pacified La Vendée. In 1802–4 he was ambassador at Constantinople, and the latter year was made a marshal. Losing the favor of Napoleon, he remained without employment for some years, but on the return of Napoleon from Elba he received command, which he was soon after compelled to surrender at the second restoration. He then set out for Paris, but was attacked and brutally killed by the populace at Avignon.

**Bruneau** (brü'no), ALFRED, French musical composer, born 1857. He is best known by his productions in the field of music-drama. In 1891 appeared his opera *Le Rêve*, with its libretto founded on Zola's novel. Zola himself wrote the libretti for the operas *Messidor* (1897) and *L'Ouragan* (1901).

**Brunehilda** (brün-hil'da), a Visigothic princess, married to Siegebert I, King of Austrasia, in 568. To avenge her sister (assassinated at the instigation of Fredegonde) she involved her husband in a war with his brother Chilperic, in the course of which Siegebert was murdered, A.D. 575, and she herself taken prisoner. She induced Meroveus, one of Chilperic's sons, to marry her, effected her escape, recovered her authority and maintained it till 613, when she was captured by Fredegonde's son, Clothaire II, of Soissons, who had her torn to pieces by wild horses.

**Brunei** (brö'nī), a native state on the west coast of the island of Borneo. In 1906 it became a British protectorate. Area, 8100 square miles; population 25,000.—BRUNEI, the chief town and residence of the Sultan, is built entirely over the water; population 10,000. Some coal is mined, the Rajah of Sarawak having a monopoly of coal mining. Crutch and other jungle products are exported. A British resident supervises the general administration. A loan of $200,000, made by the Federated Malay States in 1906, was used partly for buying out some of the monopolists who had obtained the right to collect the revenues.

**Brunel** (brö-nel'), ISAMBARD KINGDOM, an English engineer, son of Sir Mark Isambard Brunel, born in 1806; died in 1859. He was educated

at the Henri IV College, Paris; and commenced practical engineering under his father, acting at twenty as resident engineer at the Thames Tunnel. Among his best-known works were the *Great Western*, *Great Britain*, and *Great Eastern* steamships; the entire works on the Great Western Railway, to which he was appointed engineer in 1833, the Hungerford suspension bridge, docks at Plymouth, Milford Haven, etc.

**Brunel,** SIR MARK ISAMBARD, a distinguished engineer, was the son of a Normandy farmer, and born near Rouen in 1769. He was educated in Rouen, his mechanical genius early displaying itself. In 1786 he entered the French naval service, and in 1793 only escaped proscription by a hasty flight to America, where he joined a French expedition to explore the regions around Lake Ontario. He was afterwards employed as engineer and architect in the city of New York, erecting forts for its defense, and establishing an arsenal and foundry. In 1799 he proceeded to England and settled at Plymouth, quickly gaining reputation by the invention of an important machine for making the block-pulleys for the rigging of ships. Among his other inventions were a machine for making seamless shoes, machines for making nails and wooden boxes, for ruling paper and twisting cotton into hanks, and a machine for producing locomotion by means of carbonic acid gas; but his greatest engineering triumph was the Thames tunnel, commenced March, 1825, and opened in 1843. In 1841 the honor of knighthood was conferred on him. He died in Dec., 1849.

**Brunelleschi** (brö-nel-es'kē), FILIPPO, an Italian architect, born in 1377 at Florence. He won some reputation as an inventor and sculptor, and made special studies in the then little known science of perspective, but devoted himself particularly to architecture. When at Rome with Donatello he conceived the idea of bringing architecture back to Græco-Roman principles as opposed to the dominant Gothic. In this he was successful, his work opening the way for Alberti, Bramante, Vignola, and Palladio. His great achievement was the dome of the cathedral of Santa Maria at Florence, the possibility of which was denied by other architects. It has remained unsurpassed, the dome of St. Peter's, though it excels it in height, being inferior to it in massiveness of effect. Other important works by him were the Pitti Palace at Florence, the churches of San Lorenzo and Spirito Santo, and the Capella dei Pazza. Died in 1446.

**Brunet** (brü-nā), JACQUES CHARLES, a French bibliographer and bookseller at Paris, born 1780; died 1867. He began his bibliographical career by the preparation of several auction catalogues, and of a supplementary volume to the *Dictionnaire Bibliographique* of Cailleau and Duclos (Paris, 1802). In 1810 was published the first edition of his valuable *Manuel du Libraire*, which has gone through many editions and extensions, and is still perhaps the best book of its class.

**Bruni.** See *Brunei.*

**Bruni,** LEONARDO. See *Bruno.*

**Brunings** (brö'ningz), CHRISTIAN, a great hydraulic architect of Holland, born in 1736; appointed general inspector of rivers by the States of Holland in 1769; died in 1805.

**Brünn** (b r ü n), an Austrian city, capital of Moravia, on the railway from Vienna to Prague, nearly encircled by the rivers Schwarzawa and Zwittawa. It contains a cathedral and other handsome churches; a landhaus, where the provincial assembly meets, and several palaces; and has extensive manufactures of woolens, which have procured for it the name of the Austrian Leeds. It is the center of Moravian commerce, a great part of which is carried on by fairs. Near it is the fortress of Spielberg, in which Trenck and Silvio Pellico were confined. Pop. 125,137.

**Bruno,** GIORDANO (jor-dä'nō brö'nō), an Italian philosopher of the Renaissance, born at Nola about 1550. He entered the order of Dominicans, but was accused of impiety, and, after enduring much persecution, fled from Rome about 1577 to Geneva. Here he was soon persecuted in turn by the Calvinists, and traveled slowly through southern France to Paris, where he was offered a chair of philosophy, but declined to fulfill its conditions of attendance at mass. He lectured for some time, however, but in opposition to the antiquated Aristotelianism of the time and in exposition of a logical system based on the *Ars Magna* of Raymond Lully. In 1583 he went to London, where he published several of his works, and to Oxford, where he taught for a short time. In 1585 he went by way of Paris and Marburg to Wittenberg, and from 1586 to 1588 taught his philosophy there. He next went to Prague and to Helmstedt, where he remained till 1589; thence to Frankfort until 1592; and finally to Padua, where

he remained until the inquisition of Venice arrested him and transferred him to Rome. After an imprisonment of seven years, during which he steadfastly refused to retract his doctrines, he was burned, February 16, 1600, for apostasy, heresy, immorality, and violation of vows. Most of his works were published between 1584 and 1591, the chief being the *Cena de la Ceneri* ('Ash-Wednesday Table-talk,' dialogues giving an exposition of the Copernican theory); the *Spaccio della Bestia Trionfante* ('Expulsion of the Triumphant Beast,' a moral allegory); the *Della Causa, Principio ed Uno;* and the *Dell' Infinito, Universo, e Mondi*—all in 1584; the *Cabala del Cavallo Pegaseo* in 1585; and the three metaphysical works, *De Triplici Minimo et Mensura; De Monade, Numero et Figura;* and *De Immenso et Innumerabilibus*—all in 1591. His doctrines form a more complete Pantheistical system than had been previously exhibited, and represent the most advanced stage of the thought of the period.

**Bruno** (brö'nō), or Bruni (Brunus), Leonardo, an Italian scholar, born in 1370 at Arezzo, whence his name *Aretino*. He was secretary to the papal chancery under Innocent VII, Gregory XII, Alexander V, and John XXIII. On the deposition of the latter he escaped to Florence, where he wrote his history of Florence, received in consequence the rights of citizenship, and afterwards, by the favor of the Medici, became secretary to the republic till his death in 1444. He did much to advance the study of Greek literature by his literal Latin translations from Aristotle, Demosthenes, Plutarch, etc., and was the author of biographies of Dante and Petrarca.

**Bruno,** St.—1. The Benedictine apostle of Prussia who accompanied St. Adalbert to Prussia, was appointed chaplain to the Emperor Henry II, and who, having been taken by the Pagans of Lithuania, had his hands and feet cut off, and was beheaded in 1008. 2. The founder of the order of Carthusian monks, born at Cologne about 1030 of an old and noble family; appointed by Bishop Gervais superintendent of all the schools of the Rheims district, whither he attracted many distinguished scholars, among others Odo, afterwards Pope Urban II. Subsequently he was offered the bishopric of Rheims, but, declining it, repaired with six friends to Hugo, Bishop of Grenoble, who, in 1084 or 1086, led them to the Chartreuse, the spot from which the order of monks received its name. Here, in a bleak and narrow valley, Bruno and his companions built an oratory, and small separate cells for residence. In 1089 he reluctantly accepted the invitation of Urban II to Rome, but refused every spiritual dignity, and in 1094 founded a second Carthusian establishment in Della Torre, Calabria. Here he died in 1101. He was beatified by Leo X and canonized by Gregory XV.

**Bruno The Great,** Archbishop of Cologne and Duke of Lorraine, third son of Henry the Fowler, and brother of the Emperor Otho I. He was employed in various important negotiations, and was a great patron of learning. Commentaries on the *Pentateuch*, and some biographies of saints, are ascribed to him. He died in 965, at Rheims.

**Brunonian Theory** (in medicine). See *Brown, John.*

**Brunswick** (brunz'wik; German name, *Braunschweig*), a duchy and sovereign state in the northwest of Germany, area 1425 sq. m. It is divided into several detached portions, surrounded by the Prussian provinces of Hanover, Saxony, and Westphalia. A good portion of it is hilly or undulating, and it partly belongs to the Harz mountain system. Mining is carried on chiefly in the Harz, and the minerals include iron, lead, copper, brown coal, etc. About half the surface is arable, and the chief cultivated products are grain, flax, hops, tobacco, potatoes, and fruit. Brewing, distilling, the manufacture of linens, woolens, and leather, the preparation of paper, soap, tobacco, beet-sugar, with agriculture and mining, afford the principal employment of the people. As a state of the German Empire it sends two members to the Bundesrath, and three deputies to the Reichstag. In its internal government it is a constitutional monarchy. On the death of the Duke of Brunswick without issue in 1884 the Duke of Cumberland claimed the succession. Bismarck, however, interfered, and the Brunswick diet decided to place the duchy under a regent, Prince Albrecht of Prussia being elected to the post. Pop. 494,339, mostly Lutherans by religion. (See *Brunswick, Family of.*)

—Brunswick, the capital, is situated on the Oker, and on the railway from Hanover to Berlin. The older streets are narrow, tortuous, and antiquated. The principal buildings of note are the ducal palace, the cathedral of St. Blaise (1173), St. Catherine's Church (dating from 1172), and St. Magnus' (1031), the Gewandhaus, and the fine old Gothic

Council House. The educational institutions include the polytechnic school, a gymnasium, etc., and there are a city museum, a ducal museum, and a public library. The principal manufactures are wool, linen, jute, machinery, sewing-machines, etc. Pop. (1910) 143,319.

**Bruns'wick,** a city of Georgia, county seat of Glynn county, on St. Simon's Sound, 80 miles s. s. w. of Savannah. It has a very large shipping trade in cotton, lumber, phosphates and naval stores, contains a large turpentine and rosin plant, and is a popular winter resort. Pop. 10,182.

**Brunswick,** a town of Maine, on the Androscoggin, 9 miles w. of Bath. At Bowdoin College, in this town, Hawthorne and Longfellow graduated in 1825, and the latter filled the chair of modern languages for several years. It has cotton and paper mills and other industries. Pop. 6621.

**Brunswick,** FAMILY OF, a distinguished family founded by Albert Azo II, Marquis of Reggio and Modena, a descendant, by the female line, of Charlemagne. In 1047 he married Cunigunda, heiress of the Counts of Altorf, thus uniting the two houses of Este and Guelph. From his son, Guelph, who was created Duke of Bavaria in 1071, and married Judith of Flanders, a descendant of Alfred of England, descended Henry the Proud, who succeeded in 1125, and by marriage acquired Brunswick and Saxony. Otho, the great-grandson of Henry by a younger branch of his family, was the first who bore the title of Duke of Brunswick (1235). By the two sons of Ernest of Zell, who became duke in 1532, the family was divided into the two branches of Brunswick-Wolfenbüttel (II) and Brunswick-Hanover, from the latter of which comes the present royal family of Britain. The former was the German family in possession of the duchy of Brunswick until the death of the last duke in 1884. George Louis, son of Ernest Augustus and Sophia, granddaughter of James I of England, succeeded his father as Elector of Hanover in 1698, and was called to the throne of Great Britain in 1714 as George I.

**Brunswick,** FERDINAND, DUKE OF, fourth son of Duke Ferdinand Albert, was born at Brunswick 1721. In 1739 he entered the Prussian service, was engaged in the Silesian wars, and in the Seven Years' war commanded the allied army in Westphalia. He drove the French from Lower Saxony, Hesse, and Westphalia, and was victorious at Crefeld and Minden. After the peace he retired to Brunswick, and died in 1792.

**Brunswick,** FRIEDRICH WILHELM, DUKE OF, fourth and youngest son of Duke Karl Wilhelm Ferdinand of Brunswick; born in 1771. During the war against France, in 1792 and subsequently, he fought in the Prussian armies, was twice wounded, and once made prisoner with Blücher at Lubeck. For the campaign of 1809 he raised a free corps in Bohemia, but was compelled to embark his troops for England, where he was received with enthusiasm. His corps immediately entered the British service, and was afterwards employed in Portugal and Spain, the parliament granting him a pension of £6000, until he returned to his hereditary dominions, 1813. The events of 1815 called him again to arms, and he fell at Quatie Bras, 1815. Caroline, wife of George IV, was a sister of this prince.

**Brunswick,** KARL WILHELM FERDINAND, DUKE OF, born in 1735; entered upon the government in 1780. He received the chief command of the Austrian and Prussian army against France in 1792, and designed to press forward from Lorraine to Paris, but, after taking Longwy and Verdun, was baffled in Champagne by Dumouries, defeated at Valmy by Kellerman, and obliged to evacuate the province. In 1793 the duke, in conjunction with the Austrians, opened the campaign on the upper Rhine, took Königstein and Mentz, and prepared to attack Landau. After a long struggle with varying success the Austrian lines were broken by Pichegru, and the duke was obliged to follow their retreat across the Rhine. At Auerstadt he was mortally wounded in 1806.

**Brunswick Black,** a varnish composed chiefly of lampblack and turpentine, and applied to cast-iron goods. Asphalt and oil of turpentine are also ingredients in some kinds of it.

**Brunswick Green,** commonly a carbonate of copper mixed with chalk or lime.

**Brusa,** BROUSSA (brö'sä), or BURSA, a Turkish city in Asia Minor, south of the Sea of Marmora, about 20 miles distant from its port, Mudania, with a pop. of about 110,000 Turks, Greeks, Armenians, and Jews, engaged in commerce, and the manufacture of satins, silk stuffs, carpets, gauze, etc.; meerschaum, obtained in the vicinity, is made into pipebowls. The town is situated in a fertile plain, which is enclosed by the ridges of Olympus, and abounds in hot springs. Brusa repre-

sents the ancient Prusa, long capital of Bithynia, and one of the most flourishing towns in the Greek Empire of Constantinople. It was the residence of the Turkish sovereigns from 1329 until the transference of the seat of empire to Adrianople in 1365.

**Brush,** a well-known implement used for various purposes. There are two chief varieties, those with stiff hair or fibers and those with flexible, The former are made of hog's bristles, whalebone fibers, vegetable fibers of various kinds (brush-grass, palms, etc.), and sometimes wire is made to serve the same purpose. The latter are made of hog's bristles or of the hair of the camel, badger, squirrel, sable, goat, etc., and are chiefly used for painting, the smallest kinds, made round, being called *pencils*.

**Brush,** CHARLES FRANCIS, electrician, born at Euclid, Ohio, in 1849. He took part in the invention of the dynamo and invented the Brush arc-lamp. In 1881 he was made a chevalier on the French Legion of Honor.

**Brush-grass** (*Andropōgon gryllus*), a grass of South Europe, with stiff, wiry roots, which are used for making brushes.

**Brush-turkey.** See *Tallegalla*.

**Brush-wheel,** a toothless wheel sometimes used in light machinery to turn a similar wheel by means of bristles or some brushlike or soft substance, as cloth, buff-leather, India rubber, or the like.

**Brussa.** See *Brusa*.

**Brussels** (brus'elz; Flemish, *Brussel;* French, *Bruxelles*), the capital of Belgium and of the province of Brabant, is situated on the small river Senne, which is not navigable, but serves as a canal-feeder. The city consists of a northwestern or lower portion and a southeastern or upper portion. The older part is surrounded with fine boulevards on the site of its fortifications, and in many places presents a congeries of twisted streets. The upper town, which is partly inside the boulevards and partly outside, is the finest part of the city, and contains the king's palace, the palace of the chambers, the palace of justice (a magnificent new building of colossal proportions in the classical style, ranking among the finest in Europe), the palace of the fine arts, the public library and museum, etc.; and has also a fine park of 17 acres, around which most of the principal buildings are situated. The lower town retains much of its ancient appearance. The Hôtel de Ville (1401–55) is an imposing Gothic structure, with a spire 364 ft. in height, the square in front of it being perhaps the most pictorial of all the public places of Brussels. The Cathedral of Saint Gudule (dating in part from the 13th century) is the finest of many fine churches, richly adorned with sculptures and paintings. The whole town is rich in monuments and works of art. The institutions comprise a university, an academy of science and the

Town Hall, Brussels.

fine arts and polytechnic school; one of the finest observatories in Europe, a conservatorium of music; a public library, containing more than 450,000 volumes and 30,000 MSS.; a picture-gallery, with the finest specimens of Flemish art; and many learned societies and educational organizations. The manufactures and trade are greatly promoted by canal communications with Charleroi, Mechlin, Antwerp, and the ocean, and by the net-

work of Belgian railways. The industries are varied and important. Lace was an ancient manufacture, and is still of great importance; the manufacture of cotton and woolen fabrics, paper, carriages, and many minor manufactures are carried on. There are breweries, distilleries, sugar-refineries, foundries, etc. The language spoken by the upper classes is French, and Flemish is that of the lower; but German, Dutch, and English are also a good deal spoken.—During the middle ages Brussels did not attain great importance. It was walled by Baldric of Louvain in 1044; was more completely fortified in 1380; and was twice burned and once ravaged by the plague during the 15th century. It was bombarded and burned by the French in 1695; and was again taken by the French in 1794, and retained till 1814, when it became the chief town of the department of the Dyle. From 1815 to 1830 it was one of the capitals of the Kingdom of the Netherlands, and in 1830 was the chief center of the revolt which separated Belgium from Holland. It fell into German hands during the European war following the gallant but unsuccessful attempt of the Belgians to hold back the Teuton forces at Liège (*q. v.*). Brussels was occupied August 20, 1914, without resistance. The population of the capital before the war was 663,600. The Germans laid a huge indemnity upon the city and undertook a system of deportation that shocked the whole world.

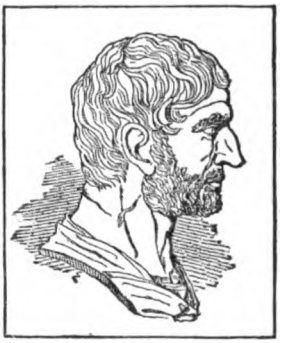
**Brussels Carpet.** See *Carpet.*

**Brussels Sprouts,** one of the cultivated varieties of cabbage (*Brassica oleracea*), having an elongated stem 4 or 5 feet high, with small clustering green heads like miniature cabbages. They are cultivated in great quantities near Brussels.

**Brutus,** DECIMUS JUNIUS, served under Julius Cæsar in Gaul, and was afterwards commander of his fleet, but, like his relative, Marcus Junius Brutus, joined in the assassination of Cæsar. He was afterwards for a short time successful in opposing Antony, but was deserted by his soldiers in Gaul and betrayed into the hands of his opponent, who put him to death in B.C. 43.

**Brutus,** LUCIUS JUNIUS, an ancient Roman hero, son of Marcus Junius by the daughter of the elder Tarquin. He saved his life from the persecutions of Tarquin the Proud by feigning himself insane, whence his name *Brutus* (stupid). On the suicide of Lucretia (see *Lucretia*), however, he threw off the mask, and headed the revolt against the Tarquins. Having secured their banishment, he proposed to abolish the regal dignity and introduce a free government, with the result that he was elected to the consulship, in which capacity he condemned his own sons to death for conspiring to restore the monarchy. He fell in battle B.C. 509.

**Brutus,** MARCUS JUNIUS, a distinguished Roman, born B.C. 85; was at first an enemy of Pompey, but aided him after the outbreak of civil war until the battle of Pharsalia. He then surrendered to Cæsar, who made him in the following year governor of Cisalpine Gaul, and afterwards of Macedonia. He soon, however, as an ardent patriot, joined the conspiracy against Cæsar, and by his influence ensured its success. After the assassination of Cæsar he took refuge in the East, made himself master of Greece and Macedonia, and with a powerful army joined Cassius in the subjugation of the Lycians and Rhodians. In



Marcus Junius Brutus—Antique Bust.

the meantime the triumvirs, Octavianus, Antony, and Lepidus, had been successful at Rome, and were prepared to encounter the army of the conspirators, which, crossing the Hellespont, assembled at Philippi in Macedonia. Cassius appears to have been beaten at once by Antony; and Brutus, though temporarily successful against Octavianus, was totally defeated twenty days later. He escaped with a few friends; but, seeing that his cause was hopelessly ruined, fell upon the sword held for him by his confidant Strato, and died (B.C. 42).

**Brüx** (brüks), a town of Bohemia, on the Biela, in the neighborhood of which are extensive coal-fields and the famous mineral springs of Seidlitz and Püllna. Pop. 21,525.

**Bruyère** (brü-yār), JEAN DE LA, a French writer, born at Paris in 1645. He was employed in the

education of the Duke of Bourbon, grandson of the great Condé, with a pension of 3000 livres, and was attached to his person during his life. Died 1696.

**Bryan** (brī'an), WILLIAM JENNINGS, lawyer and statesman, born at Salem, Illinois, in 1860. He graduated at Illinois College, Jacksonville, Ill., 1881; studied law in Chicago, and in 1887 settled in Lincoln, Nebraska. A fluent and capable orator, he took an active part in Democratic politics, and in 1892 became editor of the Omaha *World Herald* and an earnest advocate of 'free silver' coinage. In 1896 he was nominated for the presidency by the Democratic and People's parties, as the result of an eloquent speech in the Democratic national convention of delegates, but was defeated. He was again nominated in 1900 and a third time in 1908, each time being unsuccessful. In his several campaigns for the presidency he drew enormous audiences by his brilliant powers of oratory. In January, 1901, he began the publication of the *Commoner*, a Democratic newspaper. In 1913 he was appointed Secretary of State. On June 8, 1915, he resigned on the ground that he differed with President Wilson's policy toward Germany in the European War, a policy which he believed to be detrimental to the cause of peace.

**Bryant** (brī'ant), WILLIAM CULLEN, an American poet and journalist, born in Cummington, Mass., in 1794. At ten years of age he published translations from Latin poets; at thirteen wrote *The Embargo;* and at eighteen his famous poem the *Thanatopsis*. In 1815 he was admitted to the bar, and practised with success till 1825, when he established the *New York Review*. In 1826 he became assistant editor of the *Evening Post*, a leading organ of the New York Democrats, of which he was long chief editor. His poems, first collected in 1832, took rank as the best America had up to that time produced. In 1842 he issued *The Fountain and other Poems;* and a new edition of his poems in 1858 was followed by metrical translations of the *Iliad*, in 1869 and of the *Odyssey* in 1871. His *Letters of a Traveler* record his visits to Europe in 1834. He died in 1878.

**Bryce** (brīs), JAMES, a British man of letters and statesman, born at Belfast in 1838, and called to the bar in 1867. He was regius professor of civil law at Oxford 1870–93. He had already published his *Holy Roman Empire*, and taken high rank as a historical writer. His *American Commonwealth* is the best work on our system of government. Elected to Parliament in 1880, he was made Chief Secretary for Ireland Dec., 1905, and ambassador to the United States in 1907. He resigned in 1912, and the following year was appointed a member of the Hague Court of Arbitration.

**Bryn Mawr College** (brin mär'), a non-sectarian college for women situated at Bryn Mawr, Pa., 10 miles W. N. W. of Philadelphia. It had in 1911, 60 instructors, 425 students and a library of 60,000 volumes.

**Bryony** (brī'o-ni), BRYONIA, a genus of plants, nat. order Cucurbitaceæ (gourds). The common bryony, a European species (*B. dioica*), is a climbing plant common in hedges.

**Bryozoa** (brī-o-zō'a; Gr. *bryon*, moss, and *zōon*, an animal), a name formerly given to the Polyzoa, from their moss-like appearance.

**Buansuah** (bu-an-sū'a; *Cyon primævus*), a wild dog of Northern India.

**Bubalus** (bū'ba-lus), the genus to which the buffalo belongs.

**Bubastis** (bū-bas'tis), an ancient Egyptian town, so named from the goddess Bast, supposed to answer to the Greek Artêmis or Diana. The cat was sacred to her, and the Bubasteia, or festivals of the goddess, were the largest and most important of the Egyptian festivals.

**Bubo** (bū'bō), an inflammatory swelling of a lymphatic gland, usually occurring in the groin, but also elsewhere.

**Bubo**, a genus of owls, including the great horned or eagle owl (*B. maximus*), and the Virginian horned owl (*B. virginiānus*).

**Bubonic Plague** (bū-bon'ik), one of the most deadly of epidemic diseases. It is supposed to be the same as the Black Death or plague of the past centuries. (See *Plague.*) It receives its modern name from the fact that it attacks the lymphatic glands in the neck, armpits, groins, etc., producing bubos, and causing the skin to be mottled with purple spots. It has recently been discovered to be due to a bacillus, which has been identified in the blood of the patients and resembles that of chicken pox. Its ravages have been especially fatal in the East, where heedlessness as to sanitation and pure air expose the people to its attacks. It was so fatal in a recent outbreak at Bomby, India, that half the population fled from the city. Careful quarantine has kept it out of western Europe in recent years, but in 1900 it made its appearance in the Chinese quarter of San Francisco, where it was soon found that rats from shipboard, or rather

the fleas which infest the rats, conveyed the death-dealing germs. To eradicate it, a crusade was instituted against the rats of that city, which were killed in multitudes. In 1896 an anti-plague serum was administered to a Chinaman severely affected by the disease and proved effective, so that a remedy seems in hand against this dreaded disease. But sanitary regulations appear to afford comparative exemption, and its occasional title of the 'poor man's disease' probably arises from lack of cleanliness in the lower strands of population.

**Buccaneers** (buk-a-nērs'), a name derived from the Carib word *boucan*, a place for smoking meat, first given to European settlers in Hayti or Hispaniola, whose business was to hunt wild cattle and swine and smoke their flesh. In an extended sense it was applied to English and French adventurers, mostly seafaring people, who, combining for mutual defense against the arrogant pretensions of the Spaniards to the dominion of the whole of America, frequented the West Indies in the 17th century, acquired predatory and lawless habits, and became ultimately, in many cases, little better than pirates. The earliest association of these adventurers began about 1625, but they afterwards became much more formidable, and continued to be a terror until the opening of the 18th century, inflicting heavy losses upon the shipping trade of Spain, and even attacking large towns. Among their chief leaders were Montbars (Il exterminador), Peter the Great of Dieppe, L'Olonnas, de Busco, Van Horn, and the Welshman Henry Morgan, who, in 1670, marched across the isthmus, plundered Panama, and after being knighted by Charles II, became deputy-governor of Jamaica. The last great exploit of the buccaneers was the capture of Carthagena in 1697, after which they are lost sight of in the annals of vulgar piracy.

**Buccinator** (buk-si-nā'ter; Latin, a trumpeter, from *buccina*, trumpet), the trumpeter's muscle, a flat thin muscle forming the wall of the cheek, assisting in mastication and regulating the expulsion of the air in whistling or playing a wind-instrument.

**Buccleugh** (bu'klŭ), the title (now a dukedom) of one of the oldest families in Scotland, tracing descent from Sir Richard le Scott in the reign of Alexander III (latter half of the 13th century), and first becoming conspicuous in the person of the border chieftain Sir Walter Scott of Branxholm and Buccleugh—the latter an estate in Selkirkshire. The son of Sir Walter, bearing the same name, was for his valor and services raised to the peerage in 1606 as Lord Scott of Buccleugh, and his successor was made an earl in 1619. In 1663 the titles and estates devolved upon Anne, daughter of the second earl, who married the Duke of Monmouth, illegitimate son of Charles II, the pair in 1673 being created Duke and Duchess of Buccleugh, etc. Subsequently the dukedom of Queensberry passed by marriage into the family.

**Buccon'idæ.** See *Barbets.*

**Bucentaur** (bū-sen'tȧr), a mythical monster, half man and half ox. The splendid galley in which the Doge of Venice annually wedded the Adriatic bore this name.

**Bucephalus** (bū-sef'a-lus; 'Ox-head'), the horse of Alexander the Great. On its death from a wound Alexander built over its grave, near the Hydaspes, a city called *Bucephala.*

**Bucer** (bų'tser), MARTIN, a 16th century reformer, whose real name was Kuhhorn, cowhorn, of which *Bucer* is meant to be the Greek equivalent; born in 1491 at Schlettstadt, in Alsace. In 1521 he left the Dominican order and became preacher at the court of the Elector Frederick, and afterwards in Strasburg, where he was professor in the university for twenty years. In 1548 Edward VI invited him to Cambridge, where he held the office of professor of theology, and died in 1551. In 1557 Queen Mary caused his bones to be burned. Cardinal Contarini called him the most learned divine among the heretics. He wrote a commentary on the Psalms under the name of Aretius Filinus, and many other works.

**Bu'ceros.** See *Hornbill.*

**Buch** (bų*h*), LEOPOLD VON, a German geologist, born in 1774; died in 1853. He made extensive geological excursions on the continent of Europe, and also visited the Canary Islands, the Hebrides, and the coasts of Scotland and Ireland. He was the author of various important works; and compiled a magnificent geological map of Germany.

**Buchan** (bu*h*'an), a district of Scotland, lying in the N. E. of Aberdeenshire, between the mouths of the Deveron and the Ythan.

**Buchan** (buk'an or bu*h*'an), WILLIAM, a Scotch medical writer, born in 1729; studied at Edinburgh, and commenced practice there, where also he published in 1769 his work entitled *Domestic Medicine; or, the Family Physician*—the

first work of the kind published in Britain. Before his death, in 1805, nineteen large editions had been sold. It was translated into French, and became even more popular on the Continent and in America than at home. Buchan was induced by its success to remove to London, where for many years he enjoyed a lucrative practice.

**Buchanan** (bu-kan'an), CLAUDIUS, a distinguished missionary in India, born at Cambuslang, Scotland, in 1766. He was educated at the Universities of Glasgow and Cambridge; became chaplain to the East India Company in 1795; and in 1800 was appointed professor of Greek, Latin, and English, and vice-provost in the college at Fort-William. He returned to Europe in 1808, and in 1811 published his *Christian Researches in Asia*, with a Notice of the Translation of the Scriptures into the Oriental Languages. He died in 1815.

**Buchanan,** GEORGE, a Scottish reformer, historian, scholar, and Latin poet, born in the parish of Killearn, Stirlingshire, in 1506. An uncle sent him in 1520 to the University of Paris, but the death of his uncle compelled his return, and in 1523 he joined the French auxiliaries employed by the regent, Albany, serving as a private soldier in one campaign against the English. He was then sent to the University of St. Andrews, where he took the Arts degree in October, 1525. Following his tutor, Mair or Major, to France, he became in 1526 a student in the Scots College of Paris; took his degrees; in 1529 was elected professor in the College of St. Barbe; and in 1532 was engaged as friend and tutor of Gilbert Kennedy, Earl of Cassillis, with whom he resided for five years, and to whom he inscribed his first published work, a translation of Linacre's *Rudiments of Latin Grammar*, printed in 1533. In 1536 Cassillis and Buchanan returned to Scotland, where the latter published his *Somnium*, a satire against the Franciscans. To shield him from the hostility of the Catholic party, James V retained him as preceptor to his natural son James Stuart, encouraging him to write the *Franciscanus*, one of the most pungent satires to be found in any language. By the Catholic influence he was arrested in 1539, but escaped to London and thence to France, where he became professor of Latin at Bordeaux, wrote his tragedies *Jephthes* and *Baptistes*, and translated the *Medea* and *Alcestis* of Euripides. Among his pupils was Montaigne, and he was on intimate terms with the elder Scaliger. From Bordeaux Buchanan removed to Paris, and thence to Portugal to take a chair in the University of Coimbra. Here he was sentenced by the Inquisition to be confined in a monastery, but at length received permission to depart, and was shortly afterwards appointed to a regency in the College of Boncourt at Paris, an office held by him till 1555, when he was engaged as tutor to the son of the Comte de Brissac. During this period a portion of his version of the Psalms in Latin verse was published. About 1560 he returned to Scotland, and for some time acted as tutor to the young Queen Mary, to whom he dedicated his version of the Psalms. He had now openly joined the leaders of the Reformation. In 1566 he was nominated principal of St. Leonard's College, St. Andrews, and in the following year was chosen moderator of the General Assembly, the only instance of the chair being held by a layman. When Elizabeth called witnesses from Scotland to substantiate the charges against Mary, Buchanan accompanied the Regent Moray into England, and his evidence against her was highly important. In 1570 he was selected to superintend the education of King James, whom he made an excellent scholar. He was also appointed keeper of the privy-seal, a post which he held till 1578. In 1579 he published his *De Jure Regni apud Scotos*, a work in which he defended the rights of the people to judge of and control the conduct of their governors, and which subsequently had much influence on political thought. The dedication of his *Rerum Scoticarum Historia* ('History of Scotland') to the king is dated August 29, 1582, and on the 28th September following Buchanan died. As a Latinist both in prose and verse he was perhaps the best of his day, as evidenced by his *History* and his version of the Psalms. As regards its matter, the former is entirely uncritical, and is of value only for matters belonging to his own time.

**Buchanan,** JAMES, fifteenth president of the United States, born in Pennsylvania in 1791; son of an Irishman who had quitted Europe in 1783. James Buchanan was educated at Dickinson College, Carlisle; was admitted to the bar in 1812; was elected to the legislature in Pennsylvania in 1814; and in 1820 was elected to Congress, of which he continued a member till 1831. After having been sent to Russia to conclude a commercial treaty, he was in 1834 elected to the Senate, and under the presidency of Polk (1845–49) was appointed secretary of state. During the

presidency of General Taylor he retired from public life, but in 1853 General Pierce, who was then president, named him minister of the United States at London. He returned to America in 1856 as Democratic candidate for the presidency, and was elected by a large majority over Fremont, the Republican candidate, and inaugurated in March, 1857. The storm which broke out on the election of Lincoln and the secession from the Union of many of the southern states, brought on a situation which he was incompetent to handle, and the warlike movement in the South went on without any effort on his part to check it. He lived in retirement after the close of his administration (1861), of which he published an account two years before his death, June 1, 1868.

**Buchanan,** ROBERT, an English poet, born in 1841; died in 1901. His earliest volumes of verse—*Undertones* (1863), *Idylls and Legends of Inverburn* (1865), and *London Poems* (1866), gained him a good reputation for truth, simplicity, humor, and pathos, and he afterwards produced various volumes of poetry which were no less well received; such as *Wayside Poesies; The Drama of Kings; Ballads of Life, Love, and Humor*, etc. He also wrote novels—*The Shadow of the Sword, God and the Man, The Child of Nature, Foxglove Manor*, etc., and a number of plays.

**Buchanites** (bu-kan'its), an extraordinary sect of Scottish fanatics which sprang up in 1783 in a dissenting church at Irvine, Ayrshire, under the leadership of a Mrs. (more commonly known as Lucky) Buchan. She declared herself to be the woman of Rev., xii, and Mr. White, the clergyman of the congregation to which she belonged, her 'manchild,' and taught her followers they would be translated to heaven without tasting of death. The sect was always small, and became extinct soon after the death of Mrs. Buchan in 1792. They are said to have lived in promiscuous intercourse, and to have despised marriage.

**Buchan Ness** (bū'kan nes), the easternmost promontory of Scotland, near Peterhead, Aberdeenshire.

**Bucharest** (bö - ka - rest'). See *Bukharest.*

**Bucharia** (bö-ka'ri-a). See *Bokhara.*

**Buchez** (bü-shā), PHILIPPE JOSEPH BENJAMIN, a French physician and writer, born in 1796. He wrote *Introduction à la Science de l'Histoire* (1833) and *Traité Complet de Philosophie* (1839). Between 1833 and 1838 he published, in concert with M. Roux-Lavergne, a *Histoire Parlementaire de la Révolution Française* (40 vols.). After the revolution of 1848 he was elected to the constituent National Assembly, and was for a brief period its wholly incompetent president. Retiring from public life he confined himself to literature, his chief subsequent work being the *Histoire de la Formation de la Nationalité Française* (1859). He died in 1865.

**Buchholz** (bu̧h'hōlts), a town of Saxony, with extensive manufactures of laces, trimmings, etc. Pop. 9307.

**Buchon** (bü-shōn), JEAN ALEXANDRE, a French historical writer, born in 1791; died in 1846. After a period of European travel for the collection of documents he published his *Collection des Chroniques Nationales Françaises, écrites en Langue Vulgaire du XIIIme au XVIme Siècle* (47 vols., 1824–29), commencing with the *Chroniques de Froissart.* For a short time (1828–29) he was inspector of the archives and libraries of France. Among other works may be noted his *Histoire Populaire de Français* (1832); *La Grèce Continentale et la Morée* (1843).

**Buchu** (bu̧k'u̧). See *Bucku.*

**Buck,** the male of the fallow-deer, of the goat, rabbit, and hare.

**Buckau** (bu̧k'ou), a suburb of Magdeburg, Prussian Saxony, with flourishing manufactures, especially of machinery and iron goods.

**Buckbean,** BOGBEAN, or MARSH-TREFOIL (*Menyanthes trifoliāta*), a beautiful plant of the order Gentianaceæ, common in spongy, boggy soils, and found throughout Europe, in Siberia, and in North America. It is from 6 to 12 inches in height, and flowers in June or July, the flower-stalk terminating in a thyrse of white flowers, while the inner surface of the corolla has a coating of dense fleshy hairs. The whole plant, the root especially, has an intensely bitter taste, and formerly ranked highly as a tonic.

**Bückeburg** (bük'e-bu̧rh), a town of Germany, capital of the principality of Schaumburg-Lippe. Pop. 6000.

**Buckeye** (buk'ī), an American name for certain species of horse-chestnuts.

**Buckhound,** a kind of hound similar to but smaller than a staghound, once commonly used in Britain for hunting bucks. The Master of the Buckhounds is still the title of an officer of the royal household in England

**Buckie** (buk'ē), an important fishing town on the coast of Banffshire, Scotland. Pop. 6549.

**Buckingham** (buk'ing-am), or BUCKS, an inland county of England, bounded by Northampton, Bedford, Hertford, Middlesex, Berks, and Oxford; area about 730 sq. miles, or 467,009 acres, of which over 400,000 are under crops or permanent pasture. The rich vale of Aylesbury stretches through the center, and a portion of the Chiltern range across the south of the county, which is watered by the Ouse, the Thame, and the Thames. The breeding and fattening of cattle and pigs are largely carried on, also the breeding of horses, and much butter is made. The manufactures are unimportant, among them being straw-plaiting, thread lace, and the making of wooden articles, such as beechen chairs, turnery, etc. There are also paper-mills, silk-mills, etc. The mineral productions are of no great importance. The county comprises eight hundreds, those of Stoke, Burnham, and Desborough being known as 'the Chiltern Hundreds.' Buckingham is nominally the county town, but Aylesbury is the assize town. The county returns three members to the House of Commons for the Aylesbury, Buckingham, and Wycombe districts. Pop. 219,583.—BUCKINGHAM, the county town, a municipal borough, is pleasantly situated on a peninsula formed by the Ouse. Malting and tanning are carried on, and some lace is made. Pop. 3282.

**Buckingham,** GEORGE VILLIERS, DUKE OF, a favorite of James I and Charles I of England, was born in 1592, his father being George Villiers, knight. At eighteen he was sent to France, where he resided three years, and on his return made so great an impression on James I that in two years he was made a knight, a gentleman of the bedchamber, baron, viscount, Marquis of Buckingham, lord high-admiral, etc., and at last dispenser of all the honors and offices of the three kingdoms. In 1623, when the Earl of Bristol was negotiating a marriage for Prince Charles with the Infanta of Spain, Buckingham went with the prince incognito to Madrid to carry on the suit in person in the hope of securing the Palatinate as dowry. The result, however, was the breaking off of the marriage and the declaration of war with Spain. During his absence Buckingham was created duke. After the death of James in 1625 he was sent to France as proxy for Charles I to marry the Princess Henrietta Maria. In 1626, after the failure of the Cadiz expedition, he was impeached, but saved by the favor of the king. Despite the difficulty in obtaining supplies, Buckingham took upon himself the conduct of a war with France, but his expedition in aid of the Rochellese proved an entire failure. In the meantime the spirit of revolt was becoming more formidable; the Petition of Right was carried despite the duke's exertions; and he was again protected from impeachment only by the king's prorogation of parliament. He then went to Portsmouth to lead another expedition to Rochelle, but was stabbed on Aug. 24, 1628, by John Felton, an ex-lieutenant who had been disappointed of promotion.

**Buckingham,** GEORGE VILLIERS, DUKE OF, son of the preceding, born at Westminster 1627; studied at Trinity College, Cambridge; served in the royal army under Rupert and then went abroad. In 1648 he returned to England, was with Charles II in Scotland and at the battle of Worcester, and afterwards served as a volunteer in the French army in Flanders. He then returned to England, and in 1657 married the daughter of Lord Fairfax. At the Restoration he became master of the horse and one of the king's confidential *cabal* (1667–73). In 1666 he engaged in a conspiracy, and in 1676 was committed to the tower for a contempt by order of the House of Lords; but on each occasion he recovered the king's favor. On the death of Charles he retired to his seat in Yorkshire, where he died in 1688. Among his literary compositions the comedy of the *Rehearsal* (1671) takes the first place.

**Buckingham,** JAMES SILK, an English traveler, writer, and lecturer, born near Falmouth, in 1786. After trying several professions, and wandering over great part of the world, he came to London, where he established the *Athenæum*, well known as a literary journal. He also published his journals of travel in Palestine, Arabia, Mesopotamia, and Assyria and Media. In 1832 he was chosen member of parliament for Sheffield, and retained his seat till 1837. Subsequently he made a tour of three years in America. In 1843 he became secretary to the British and Foreign Institute. He also published volumes on his Continental tours and an autobiography. His death took place in 1855.

**Buckingham Palace,** a royal palace in London, facing St. James's Park, built in the reign of George IV, and forming one of the residences of the present king, George V.

**Buckland** (buk'land), FRANCIS TREVELYAN, English naturalist, son of Rev. W. Buckland; born in 1826; studied at Winchester and at Christ Church, Oxford. From 1848 to 1851 he was student, and from 1852 to 1853 house-surgeon, at St. George's Hospital. He became assistant-surgeon in the 2d Life-Guards in 1854. On the establishment of the *Field* newspaper in 1856 he joined the staff, writing for it until 1865. In 1866 he commenced a weekly journal of his own, *Land and Water*, and in 1867 was appointed an inspector of salmon fisheries. He died in 1880. His best-known books are his *Curiosities of Natural History* (4 vols. 1857–72), the *Logbook of a Fisherman and Zoologist* (1875), and the *Natural History of Fishes* (1881); but there was also a large mass of desultory work showing much natural sagacity. He died Dec. 20, 1880.

**Buckland,** REV. WILLIAM, an English geologist, born at Axminster, Devon, in 1784; educated at Winchester and at Corpus Christi College, Oxford, where he held a fellowship from 1808 to 1825. In 1813 he was appointed reader in mineralogy at Oxford; and in 1818 a readership of geology was expressly instituted for him. A paper contributed by him to the *Philosophical Transactions* in 1822, entitled *Account of an Assemblage of Fossil Teeth and Bones discovered in a Cave at Kirkdale, Yorkshire, in the Year 1821*, procured for him the Copley medal; and on this was founded his *Reliquiæ Diluvianæ*, published in 1823. In 1825 he was presented by his college to the living of Stoke Charity, Hants, and the same year became one of the canons of Christ Church Cathedral, Oxford. In 1832 he acted as president of the British Association. In 1836 his *Bridgewater Treatise* was published, under the title of *Geology and Mineralogy considered with Reference to Natural Theology*. In 1845 he was made Dean of Westminster, and in 1847 one of the trustees of the British Museum. He died in 1856.

**Buckle** (buk'l), HENRY THOMAS, an English historical writer, born in 1822, the son of a wealthy London merchant. At an early age he entered his father's counting-house, but at the age of eighteen, on inheriting his father's fortune, he devoted himself entirely to study. The only thing he allowed to distract him from his more serious pursuits was chess, in which he held a foremost place amongst contemporary players. His chief work, a philosophic *History of Civilization*, of which only two volumes (1858 and 1861) were completed, was characterized by much novel and suggestive thought, and by the bold co-ordination of a vast store of materials drawn from the most varied sources. While exciting much attention at the time, later study has largely invalidated its theoretical views. Three volumes of his *Miscellaneous and Posthumous Works* were edited by Helen Taylor in 1872. He died, while traveling, at Damascus, May 29, 1862.

**Buckler** (buk'ler), a kind of small shield formerly worn on the left arm, and varying in form and material, among the latter being wicker-work, wood covered with leather, a combination of wood and metal, etc.

**Buckram** (buk'ram), a coarse textile fabric stiffened with glue and used in garments to give them or keep them in the form intended.

**Buckshot,** a kind of large leaden shot used for killing deer or other large game.

**Buck'skin,** a kind of soft leather of a yellowish or grayish color, made originally from deerskins, but now usually from sheepskins. The softness which is its chief characteristic is imparted by using oil or brains in dressing it. The name is also given to a kind of cloth otherwise called doeskin.

**Buck'thorn** (*Rhamnus*), the name of an extensive genus of trees and shrubs, order Rhamnaceæ. Several species belong to N. America. The common buckthorn (*Rhamnus catharticus*), an European and North American shrub, grows to 7 or 8 ft., has strong spines on its branches, elliptical and serrated leaves, male and female flowers on different plants, a greenish-yellow calyx, no corolla, and a round black berry. It flowers in May. The berries are purgative, but harsh in action. The bark yields a yellow dye, the berries sap green. Dyer's buckthorn (*R. infectorius*) yields French or yellow berries.

**Bucku** (buk'ū), the name of several plants belonging to the Cape Colony genus *Barosma*, order Rutaceæ, used in medicine, in the form of a powder or tincture, in disorders of the urino-genital organs.

**Buckwheat** (buk'wēt), or BRANK (*Fagopyrum esculentum* or *Polygŏnum fagopyrum*), a plant of the order Polygonaceæ, with branched herbaceous stem, somewhat arrow-shaped leaves, and purplish-white flowers, growing to the height of about 30 inches, and bearing a small triangular grain of a brownish black without and white within. The shape of its seeds gives it its German name *Buchweizen*, 'beech-

wheat,' whence the English name. The plant was first brought to Europe from Asia by the Crusaders, and hence in France is often called Saracen corn. It grows on the poorest soils. It is cultivated in China and other eastern countries as a bread-corn. In Europe buckwheat has been principally cultivated as food for oxen, swine, and poultry; but in Germany it serves as an ingredient in pottage, puddings, and other food, and in the United States buckwheat griddle cakes are much esteemed.

**Bucyrus** (bū-cī'rus), a city, capital of Crawford Co., Ohio, 69 miles S. of Toledo; center of a farming country and with manufactures of machinery, fans, etc. It is celebrated for its mineral springs. Pop. 8122.

**Buczacz** (bō'chăch), a town of Austria, in Galicia, on the Stripa. Has a castle and an interesting townhall. Pop. (1910) 14,241.

**Bud,** the name of bodies of various form and structure, which develop upon vegetables, and contain the rudiments of future organs, as stems, branches, leaves, and organs of fructification. Upon exogenous plants they are in their commencement cellular prolongations from the medullary rays, which force their way through the bark. In general, a single bud is developed each year in the axil of each leaf, and there is one terminating the branch called a terminal bud. The life of the plant during winter is stored up in the bud as in an embryo, and it is by its vital action that on the return of spring the flow of sap from the roots is stimulated to renewed activity. Buds are distinguished as leaf-buds and flower-buds. The latter are produced in the axil of leaves called floral leaves or bracts. The terminal bud of a branch is usually a flower-bud, and as cultivation is capable of producing flower-buds in place of leaf-buds, the one is probably a modification of the other.

**Budapest** (bu-da-pesht'), the official name of the united towns of Pest and Buda or Ofen, the one on the right, the other on the left, of the Danube, forming the capital of Hungary, the seat of the imperial diet of the Hungarian ministry and of the supreme court of justice. Buda, which is the smaller of the two, and lies on the west bank of the river, consists of the fortified Upper Town on a hill; the Lower Town or Wasserstadt at the foot of the hill, and several other districts. Among the chief buildings are the royal castle and several palaces, the arsenal, town-hall, government offices, etc., and the finest Jewish synagogue in the empire. The mineral baths of Buda have long been famous, the Bruckbad and Kaiserbad having both been used by the Romans. Pest, or the portion of Budapest on the left or east bank of the river, is formed by the inner town of Old Pest on the Danube, about which has grown a semicircle of districts—Leopoldstadt, Theresienstadt, Elizabethstadt, etc. The river is at this point somewhat wider than the Thames at London, and the broad quays of Pest extend along it for from two to three miles. Pest retains, on the whole, fewer signs of antiquity than many less venerable towns. Its fine frontage on the Danube is modern, and includes the new houses of parliament, the academy, and other important buildings. The oldest church dates from 1500; the largest building is a huge pile used as barracks and arsenal. There is a well-attended university. In commerce and industry Budapest ranks next to Vienna in the empire. Its chief manufactures are machinery, gold, silver, copper, and iron wares, chemicals, silk, leather, tobacco, etc. A large trade is done in grain, wine, wool, cattle, etc. Budapest is strongly Magyar, and as a factor in the national life may almost be regarded as equivalent to the rest of Hungary. It was not until 1799 that the population of Pest began to outdistance that of Buda; but from that date its growth was very rapid and out of all proportion to the increase of Buda. In 1799 the joint population of the two towns was little more than 50,000; in 1886 it was 411,917; in 1910, 880,371.

**Budaun** (bu-dä'un), a town of India, N. W. Provinces, consisting of an old and a new town, the former partly surrounded by ancient ramparts; there is a handsome mosque, American mission, etc. Pop. about 35,000.—The district of Budaun has an area of 2000 sq. miles. Pop. about 1,000,000.

**Buddha** (bud'dha; 'the Wise' or 'the Enlightened'), the sacred name of the founder of Buddhism, an Indian sage who appears to have lived in the 5th century B.C. His personal name was Siddhartha, and his family name Gautama; and he is often called also Sakya-muni (from *Sakya*, the name of his tribe, and *muni*, a Sanskrit word meaning a sage). His father was the king of Kapilavastu, a few days' journey north of Benares. Siddhartha, filled with a deep compassion for the human race, left his father's court, and lived for years in solitude and contemplation till he had penetrated the mysteries of life and become the Buddha. He then began to

teach his new faith, in opposition to the prevailing Brahmanism, commencing at Benares. Among his earliest converts were the monarchs of Magadha and

Buddha.—From a Burmese Bronze.

Kosala, in whose kingdoms he chiefly passed the latter portion of his life, respected, honored, and protected. See next article.

**Bud'dhism,** the religious system founded by Buddha, one of the most prominent doctrines of which is that *Nirvâna*, or an absolute release from existence, is the chief good. According to it, pain is inseparable from existence, and consequently pain can cease only through Nirvâna; and in order to attain Nirvâna our desires and passions must be suppressed, the most extreme self-renunciation practised, and we must, as far as possible, forget our own personality. In order to attain Nirvâna eight conditions must be kept or practised. The first is in Buddhistic language *right view;* the second is *right judgment;* the third is *right language;* the fourth is *right purpose;* the fifth is *right profession;* the sixth is *right application;* the seventh is *right memory;* the eighth is *right meditation.* The five fundamental precepts of the Buddhist moral code are: not to kill, not to steal, not to commit adultery, not to lie, and not to give way to drunkenness. To these there are added five others of less importance, and binding more particularly on the religious class, such as to abstain from repasts taken out of season, from theatrical representations, etc. There are six fundamental virtues to be practised by all men alike, viz., charity, purity, patience, courage, contemplation, and knowledge. These are the virtues that are said to 'conduct a man to the other shore.' The devotee who strictly practises them has not yet attained Nirvâna, but is on the road to it. The Buddhist virtue of charity is universal in its application, extending to all creatures, and demanding sometimes the greatest self-denial and sacrifice. There is a legend that the Buddha in one of his stages of existence (for he had passed through innumerable transmigrations before becoming 'the enlightened') gave himself up to be devoured by a famishing lioness which was unable to suckle her young ones. There are other virtues, less important, indeed, than the six cardinal ones, but still binding on believers. Thus not only is lying forbidden, but evil speaking, coarseness of language, and even vain and frivolous talk must be avoided. Buddhist metaphysics are comprised in three theories—the theory of transmigration (borrowed from Brahmanism), the theory of the mutual connection of causes, and the theory of Nirvâna. According to the first, when a man dies he is immediately born again or appears in a new shape. This shape depends upon the merit or demerit of his life. He may reappear as a divinity or as a degraded slave, an animal, a plant or even a stone or clod. If he has been very wicked he will be born into one of the 136 Buddhist hells and will need many millions of years to attain the state of earthly existence again. According to the second, life is the result of twelve conditions, which are by turns causes and effects. Thus there would be no death were it not for birth; it is therefore the effect of which birth is the cause. Again, there would be no birth were there not a continuation of existence. Existence has for its cause our attachment to things, which again has its origin in desire; and so on through sensation, contact, the organs of sensation and the heart, name and form, ideas, etc., up to ignorance. This ignorance, however, is not ordinary ignorance, but the fundamental error which causes us to attribute permanence and reality to things. This, then, is the primary origin of existence and all its attendant evils. Nirvâna or extinction is eternal salvation from the evils of existence, and the end which every Buddhist is supposed to seek. Sakya-muni did not leave his doctrines in writing; he declared them orally, and they were carefully treasured up by his disciples, and written down after his death. The determination of the canon of the Buddhist scriptures as we now possess them was the work of three successive councils, and was finished two centuries at least before Christ. From Buddhism involving a protest against caste

distinctions it was eagerly adopted by the Dasyus or non-Aryan inhabitants of Hindustan. It was pure, moral, and humane in its origin, but it came subsequently to be mixed up with idolatrous worship of its founder and other deities. Although now long banished from Hindustan by the persecutions of the Brahmans, Buddhism prevails in Ceylon, Burmah, Siam, Anam, Tibet, Mongolia, China, Java, and Japan, and its adherents are said to comprise about a third of the human race.

**Buddhist Architecture.** See *Indian Architecture.*

**Budding** (bud'ing), the art of multiplying plants by causing the leaf-bud of one species or variety to grow upon the branch of another. The operation consists in shaving off a leaf-bud, with a portion of the wood beneath it, which portion is afterwards removed by a sudden jerk of the operator's finger and thumb, aided by the budding-knife. An incision in the bark of the stock is then made in the form of a T; the two side lips are pushed aside, the bud is thrust between the bark and the wood, the upper end of its bark is cut to a level with the cross arm of the T, and the whole is bound up with worsted or other soft fastening, the point of the bud being left exposed. In performing the operation, a knife with a thin flat handle and a blade with a peculiar edge is required. The bud must be fully formed; the bark of the stock must separate readily from the wood below it; and young branches should always be chosen, as having beneath the bark the largest quantity of *cambium* or viscid matter out of which tissue is formed. The maturer shoots of the year in which the operation is performed are the best. The autumn is the best time for budding, though it may also be practised in the spring.

Budding.

**Budé** (bü-dā), GUILLAUME, or BUDÆUS, a French scholar, born at Paris in 1467, and died in 1540. After a lawless youth he devoted himself to the study of literature. Among his philosophical, philological, and juridical works, his treatise *De Asse* (1514) and his *Commentarii Græcæ Linguæ* are of the greatest importance. By his influence the Collège Royal de France was founded.

**Bude Light,** an exceedingly brilliant light, invented by Mr. Gurney, of Bude, Cornwall, and produced by directing a current of oxygen into the interior of the flame of an Argand lamp or gas-burner.

**Budgell** (budj'el), EUSTACE, an ingenious writer, author of about three dozen papers, signed 'X,' in the *Spectator;* born 1686; died 1737. He was a first cousin to Addison, and went with him to Dublin in 1709 as secretary. On the accession of George I Budgell obtained several valuable Irish appointments, from which he was removed for an attack on the lord-lieutenant, the Duke of Bolton. He lost three-fourths of his fortune in the South Sea Bubble, and spent the rest in a fruitless attempt to get into parliament. Disgraced by an attempted fraud in connection with Dr. Matthew Tindal's will, he committed suicide by drowning in the Thames.

**Budget** (budj'et), the annual financial statement which the British Chancellor of the Exchequer makes in the House of Commons. It contains a view of the general financial policy of the government, and at the same time presents an estimate of the probable income and expenditure for the following twelve months, and a statement of what taxes it is intended to reduce, increase, or abolish, or what new ones it may be necessary to impose.

**Budis'sin.** See *Bautzen.*

**Budweis** (bud'vīs), a city of Bohemia, 75 miles S. of Prague, well built, with a cathedral and episcopal palace, a flourishing trade, and manufactures of earthenware, cloth, machinery, etc. Pop. 39,630.

**Buen Ayre** (bwan ī'rā), or BONAIRE, a small island off the coast of Venezuela, belonging to the Dutch, 50 miles in circumference; produces cattle, goats, poultry, and salt. Pop. 5000.

**Buenos Ayres** (bō'nus ā'riz. *Sp. pron.* bwā'nos ī'res), the largest and most important city of South America, capital of the Argentine Republic, on the S. W. bank of the La Plata, 175 miles from its mouth. It was founded successfully in 1580 by Juan de Garay, and is built with great regularity, the streets uniformly crossing each other at right angles. Many of the old and narrow streets are being replaced by modern boulevards. It contains the palace of the president, the House of Representatives, a town-hall, a number of hospitals and asylums, a cathedral, several Protestant churches; several theaters, an opera house, and a university, founded in 1821, and attended by over 4000 students. There are also a medical

school, normal and other schools, besides literary and scientific societies, a national library, museum of natural history, zoological garden and observatory. There is no harbor, and large vessels can come only within 8 or 9 miles of the town, but extensive harbor works have been begun. The nearest good harbor is at La Plata, a new town 30 miles lower down the estuary, and since 1884 the capital of the province. The port of both cities is now Ensenada, a village on the Bay of Ensenada, a few miles from La Plata. Buenos Ayres is one of the leading commercial centers of South America, its exports and imports together annually amounting to over $500,000,000. Chief exports are ox and horse hides, sheep and other skins, wool, tallow, horns, etc. There are nine railways running from the city, and 460 miles of tramway in the city and suburbs. About one-fourth of the inhabitants are whites; the rest are Indians, negroes, and mixed breeds. Population (1914). 1,560,163.—The province of Buenos Ayres has an area of about 117,777 sq. miles, and presents nearly throughout level or slightly undulating plains (*pampas*), which afford pasture to vast numbers of cattle and wild horses. These constitute the chief wealth.

**Buffalo** (buf'a-lō), an ungulate or hoofed ruminant mammal, family Bovidæ or oxen, the best-known species of which is the common or Indian buffalo (*Bubălus Buffĕlus* or *Bos Bubălus*), larger than the ox and with stouter limbs, originally from India, but now

1, Head of Cape Buffalo (*Bubalus Caffer*).
2, Head of Indian Buffalo (*Bubalus Buffelus*).

found in most of the warmer countries of the Eastern Continent. A full-grown male is a bold and powerful animal, quite a match for the tiger. The buffalo is less docile than the common ox, and is fond of marshy places and rivers. It is, however, used in tillage, draught, and carriage in Southern Asia and Italy. The female gives much more milk than the cow, and from the milk the *ghee* or clarified butter of India is made. The hide is exceedingly tough, and a valuable leather is prepared from it, but the flesh is not very highly esteemed. Another Indian species is the arnee (*B. arni*), the largest of the ox family. The Cape buffalo (*Bubălus Caffer*), the African species, is distinguished by the size of its horns, which are united at their bases, forming a great bony mass on the front of the head. It attains a greater size than an ordinary ox, and is a fierce creature, the most dreaded of African animals. It attacks man without provocation and has never been domesticated. The name is also applied to wild oxen in general, and particularly to bison of North America. See *Bison*.

**Buff'alo,** a city of New York, at the eastern extremity of Lake Erie, the mouth of the Buffalo River, and the head of the Niagara River. The position of Buffalo on the great water and railway channels of communication between the west and the east makes it the center of a vast trade in grain, livestock and other commodities. The harbor is capacious, and is protected by an extensive breakwater. The Barge Canal system has its western terminus here and in its enlarged form will permit of the passage of canal boats, of 1500 tons burden, which can carry freight from Buffalo through to New York and Boston. Buffalo is noted for its fine office buildings and beauiful homes and streets. There are six large parks, many smaller ones, and a system of boulevards. The larger buildings include the Marine Bank, the Prudential, the New York Telephone, The Iroquois, the Electric, the Manufacturers' and Traders' Bank, Ellicott Square, Chamber of Commerce, Erie County Bank, City and County Hall, Post Office, State Armory, State Arsenal, Public Library and other buildings. Other institutions include the Albright Art Gallery, The Buffalo Historical Society, Botanical Gardens, large hospitals, University of Buffalo, Technical High School and other high schools. Buffalo has some 2000 manufacturing plants, the leading industries being slaughtering and meat packing, foundry and machine shop, flour-mill and grist-mill, automobile, soap, printing and publishing and malt. Its grain trade is extensive and employs a large number of elevators with a capacity of 30,000,000 bushels. The annual handling of grain amounts to over 100,000,000 bushels; of flour, 14,000,000 barrels. There is also a large export business in livestock, lumber and coal, while the iron and steel

works rank next to those of Pittsburgh. Buffalo was founded in 1801, was burned by British and Indians in 1813, and became a city in 1832. The Pan-American Exposition, at which President McKinley was assassinated, was held here in 1901. Pop. 460,455 in 1913.

**Buffalo Berry** (*Shepherdia argentĕa*), a shrub of the oleaster family, a native of the States and Canada, with lanceolate, silvery leaves and close clusters of bright-red acid berries about the size of currants, which are made into preserves and used in various ways.

**Buffalo Bill.** See *Cody.*

**Buffalo Grass** (*Tripsdoum dactyloides*), a strong-growing North American grass, so called from forming a large part of the food of the buffalo, and said to have excellent fattening properties; called also *gama grass.*

**Buffer** (buf'er), any apparatus for deadening the concussion between a moving body and the one on which it strikes. In railway carriages they are placed in pairs at each end, and are fastened by rods to springs under the framework, to deaden the concussions caused when the velocity of part of the train is checked.

**Buffet** (buf'et, buf'ā, bō-fa'), a cupboard, sideboard, or closet to hold china, crystal, plate, and the like. The word is also very commonly applied to a space set apart for refreshments.

**Buff Leather,** a sort of leather prepared from the skin of the buffalo and other kinds of oxen, dressed with oil, like chamois. It is used for making belts, pouches, gloves, etc.

**Buffon** (bu-fōn), GEORGE LOUIS LECLERC, COUNT DE, celebrated French naturalist, was born at Montbard, Burgundy, in 1707; died in Paris in 1788. Being the son of a rich man, he was able to travel, and he visited Italy and England. In 1739 he was appointed superintendent of the Royal Garden at Paris (now the Jardin des Plantes), and devoted himself to the great work on *Natural History* which occupied the most of his life. It is now obsolete and of small scientific value, but it long had an extraordinary popularity, and was the means of diffusing a taste for the study of nature throughout Europe. After an assiduous labor of ten years the first three volumes were published, and between 1749 and 1767 twelve others, which comprehend the theory of the earth, the nature of animals, and the history of man and the mammalia. In these Buffon was assisted by Daubenton in the purely anatomical portions. The following nine volumes, which appeared from 1770 to 1783, contain the history of birds, from which Daubenton withdrew his assistance, the author being now aided by Guéneau de Montbelliard, and afterwards by the Abbé Bexon. Buffon published alone the five volumes on minerals, from 1783 to 1788. Of the seven supplementary volumes, of which the last did not appear until after his death in 1789, the fifth formed an independent whole, the most celebrated of all his works. It contains his *Epochs of Nature,* in which the author gives a second theory of the earth, very different from that which he had traced in the first volumes, though he assumes at the commencement the air of merely defending and developing the former. Buffon was raised to the rank of count by Louis XV, whose favor, as also that of Louis XVI, he enjoyed. His works were translated into almost every European language.

**Buffoon** (bu-fōn'), a merry-andrew, a clown, a jester; from the Ital. *buffone,* from *buffare,* to jest, to sport. *Buffo,* in Ital., is the name given to a comic actor; a burlesque play is called a *commedia buffa,* and a comic opera *opera buffa.* The Italians, however, distinguished the *buffo cantante,* which requires good singing, from the *buffo comico,* in which there is more acting.

**Bufonidæ** (bu-fon'i-dē), a family of tailless batrachians, comprehending the toads.

**Bug,** or BOG, a river in European Russia, which falls into the estuary of the Dnieper near Kherson, after a course of about 500 miles. Another river of same name, the Western Bug, rises in Galicia, and falls into the Vistula about 20 miles N. N. W. of Warsaw. Both are navigable for considerable distances.

**Bug,** a name given to the *Cimex lectularius,* otherwise known as the housebug or bedbug, or any member of this genus or of the family Cimicidæ. The common bug is about 3-16 inch long, wingless, of a roundish, depressed body, dirty rust color, and emits an offensive smell when touched. The female lays her eggs in summer in the crevices of bedsteads, furniture, and walls of rooms. The larvæ are small, white, and semitransparent. They attain full size in eleven weeks. The mouth of the bug has a three-jointed proboscis, which forms a sheath for a sucker. It is fond of human blood, but

eats various other substances. The name was formerly applied loosely to insects of various kinds, and in the United States it is generally applied to what are called *beetles* in England.

**Bugeaud** (bü-zhō), Thomas Robert, Duke d'Isly, a marshal of France, born in 1784; died at Paris in 1849. He entered the army in 1804 as a simple grenadier, but rose to be colonel before the fall of Napoleon. After the revolution of 1830 he obtained a seat in the Chamber of Deputies. He was afterwards sent to Algeria, where he gained many advantages over the Arabs. On the revolution of 1848 he adhered to Louis Philippe to the last. Under the presidency of Louis Napoleon he was appointed commander-in-chief of the army of the Alps.

**Bugenhagen** (bö'ge-hä-gen), Johann, a German reformer, and friend and helper of Luther in preparing his translation of the Bible. He was born in 1485, and died in 1558. He fled from his Catholic superiors to Wittenberg in 1521, where he was made, in 1522, professor of theology. He effected the union of the Protestant free cities with the Saxons, and introduced into Brunswick, Hamburg, Lübeck, Pomerania, Denmark, and many other places the Lutheran service and church discipline. He translated the Bible into Low German (Lübeck, 1533); wrote an *Exposition of the Book of Psalms* and a *History of Pomerania*.

**Bugge** (bug'ge), Elseus Sophus, a Norwegian scholar, born at Laurvig in 1833. In 1864 he became a professor of Old Norse in the national university. He published editions of old Norse poems and later folk songs, but is best known from his important works on runic inscriptions.

**Buggy** (bug'i), a name given to several species of carriages or gigs: in England, a light one-horse two-wheeled vehicle without a hood; in the U. States, a light one-horse four-wheeled vehicle, with or without a hood or top; in India, a gig with a large hood to screen those who travel in it from the sun's rays.

**Bugis** (bö'giz), a people of the Indian Archipelago, chiefly inhabiting the eastern coast and a good deal of the interior of the southern peninsula of the island of Celebes, their chief town being Boni. They are described as peaceable, orderly, and well behaved, are the chief carriers and factors of the Indian seas, and are engaged in the manufacture of iron, copper, cotton, etc., and in trepang, pearl, and other fisheries. Large communities of them have also been formed in Borneo, in Sumatra, and in many small islands of the archipelago.

**Bugle** (bū'gl), a military musical brass wind-instrument of the horn kind, sometimes furnished with keys or valves. It is used in the armies of various nations to sound signal-calls. The name is an abbreviation of *bugle-horn*, that is, buffalo-horn, from O.E. *bugle*, a buffalo.

**Bugle,** the common name for *Ajūga*, a genus of labiate plants. Two of the species are British, *A. reptans*, a hedge-side plant with dark leaves and purplish flowers, formerly held in high esteem as an application to wounds; and *A. chamæpitys*, yellow bugle, a plant which grows in sandy fields, rare in the United States.

**Bugle,** a shining, elongated glass bead, usually black, used in decorating female apparel and also in trafficking with savage tribes.

**Bugloss** (bū'glos), a popular name applied to a number of plants of the natural order Boragineæ, and in particular to the alkanet (which see).

**Buhl-work** (böl'wurk), a kind of inlaid work, said to have been invented by Boule, a French cabinet-maker, in the reign of Louis XIV. It consisted at first of unburnished gold, brass, enamel, or mother-of-pearl worked into complicated and ornamental patterns, and inserted in a ground of dark-colored metal, wood, or tortoise-shell; but at a later period the use of wood of a different color was introduced by Reisner, and to his process the modern practice of buhl-work is chiefly confined.

**Buhrstone** (bör'stōn), Burrstone, a name given to certain siliceous or siliceo-calcareous stones, whose dressed surfaces present a burr or keen-cutting texture, whence they are much used for millstones. The most esteemed varieties are obtained from the upper fresh-water beds of the Paris basin, and from the Eocene strata of South America.

**Building Societies,** joint-stock benefit societies for the purpose of raising by periodical payments a fund to assist members in obtaining small portions of landed property and houses, which are mortgaged to the society till the amount of the shares drawn on shall be fully repaid with interest. The stock is divided into shares, valued at $200 each, payable in monthly instalments of $1 for each share. In most societies the money is loaned

to the member bidding the highest premium for its use, which premium is in some cases deducted at once, in others is paid in monthly instalments. The interest on money borrowed, at the rate of six per cent. per annum, is payable monthly. Building societies are of two chief kinds, either confined to a certain number of members, or permanent and not confined to any definite number of members, but ready to receive new members as long as the society exists. These series societies, by the admission of new members, have a constant supply of funds at their disposal, and are thus able to supply the demands of all the borrowers; while the security offered to investors induces many people to enter the society merely with the view of having a convenient means of depositing their savings, and not with the intention of acquiring any real estate for themselves. In the British islands, since building societies were legalized in 1836, more than $500,000,000 has been raised by their means, and applied by their members for the acquiring of houses and lands—nearly half a million persons being assisted in buying their homes. In the United States the statistics of 1910 give as in operation 5713 societies, with over 2,000,000 members and assets of over $850,000,000. In 1893 the number of associations was 240, assets $37,000,000, so that there has been a large development since that date. These societies originated in and were long confined to Philadelphia, though they have now spread widely throughout the States. Besides other advantages, the building society gives to its members business training, accustoms them to invest sums of money, and thus fits them to take care of their earnings.

**Buitenzorg** (boi'ten-zorg; 'without care'), a favorite residential town in the island of Java, about 40 miles south of Batavia, with which it is connected by rail. It contains a fine palace of the governor-general, celebrated botanic gardens, etc. Pop. 25,000.

**Bujalance** (bö-ha-län'thä), a city of Spain, Andalusia, 21 miles E. by N. Cordova; manufactures cloth and woolen fabrics, earthenware, and glass. Pop. 10,756.

**Bukharest** (bu-ka-rest'), the capital of Roumania, situated on the Dimbovitza about 33 miles north of the Danube, in a fertile plain. It is in general poorly built, among the chief buildings being the royal palace, the National Theater, the university buildings, the National Bank, the Mint, and the Archiepiscopal church. There are handsome public gardens. Manufactures are varied but unimportant; the trade is considerable, the chief articles being grain, wool, honey, wax, wine, hides. The mercantile portion of the community is mostly foreign, and the whole population presents a curious blending of nationalities. Bukharest became the capital of Wallachia in 1665, in 1862 that of the united principalities of Wallachia and Moldavia, since known as Rumania. A treaty was concluded here in 1812 between Turkey and Russia, by which the former ceded Bessarabia and part of Moldavia; another treaty in 1886 between Servia and Bulgaria; and in 1913 the treaty between the several Balkan states. See *Balkan War*. Pop. 338,109.

The capture of the city formed the culmination of one of the most soundly conceived and brilliantly executed feats of strategy of the European war. The place was held to be extremely well defended by its outlying works, which comprised eighteen fortifications of the first class and many redoubts and batteries. Aside from Paris, it was accounted as probably the largest military camp in the world, one capable of accommodating 200,000 men. The Teutonic armies converged upon it from three directions, broke the Rumanian line in a great battle on December 3, 1916, and after a brief bombardment drove the defenders from their works. Bucharest constituted the fourth Entente capital taken by the Central Powers, the others being the capitals of Belgium, Servia and Montenegro. As in Belgium, a severe penalty amounting to $133,000,000 was exacted from the Rumanian capital. See *European War*.

**Bukovina** (bö-ko-vē'nä), an Austrian duchy, forming the S.E. corner of Galicia. Area, 4035 sq. miles; pop. (1900) 729,921. It is traversed by ramifications of the Carpathians, and much of the surface is occupied with swamps and forests. The principal crop is maize. Much fruit is grown. Chief town, Czernowitz.

**Bulacan** (bu-la-kän'), a town of the Philippines, island of Luzon, about 22 miles N. W. of Manila; chief industries: sugar-boiling and the manufacture of silken mats. Pop. 11,589.

**Bulama,** or BOLAMA (bō-lä'ma), an island on the W. coast of Africa, one of the Bissagos (which see).

**Bulandshahr** (bu-land-shär'), a district of British India, Northwestern Provinces, forming a portion of the Doab, or alluvial plain inclosed between the Ganges and the Jumna. Cotton, indigo, sugar, etc., form the chief products of the district. Area, 1899 sq. miles. The town *Buland-*

*shar*, the administrative headquarters of the district, has a pop. of about 15,000.

**Bulau** (bū'la), or TIKUS, an animal of the mole family (Talpidæ) and genus *Gymnura* (*G. Rafflesii*), a native of Sumatra and Malacca, bearing a considerable resemblance to the opossum. The muzzle is much prolonged, the fur pierced by a number of long hairs or bristles, the tail naked, and it is possessed of glands which secrete a kind of musk.

**Bulb**, a modified leaf-bud, formed on a plant upon or beneath the surface of the ground, emitting roots from its base and producing a stem from its center. It is formed of imbricated scales or of concentric coats or layers. It encloses the rudiments of the future plant and a store of food to nourish it. Examples of bulbs are the onion, lily, hyacinth, etc.

**Bulbul** (bul'bul), the Persian name of the nightingale, or a species of nightingale, rendered familiar in English poetry by Moore, Byron, and others. The same name is also given in Southern and Southwestern Asia to sundry other birds.

**Bulgaria** (bul-gā'ri-a), a principality constituted by the treaty of Berlin, and placed under the suzerainty of the sultan of Turkey, to whom it was made tributary; but rendered independent by the Treaty of London, 1913. It is bounded north by Roumania, east by the Black Sea and European Turkey, south by the Aegean Sea and Greece, and west by Servia. The principal towns are Widdin, Sofia, Plevna, Sistova, Tirnova, Rustchuk, Shumla, Varna, and Silistria. The country almost wholly belongs to the north slope of the Balkans, and is intersected by streams flowing from that range to the Danube. It possesses much good agricultural land and a good climate; but cultivation is backward, though the rearing of cattle and horses is successfully carried on. Agricultural produce is exported, manufactured goods imported. Education is backward, but is improving; four years' school attendance is obligatory in principle. The prevalent religion is that of the Greek Church. In accordance with the terms of the Treaty of Berlin a constitution was drawn up for the new principality by an assembly of Bulgarian notables at Tirnova in 1879. By this constitution the legislative authority is vested in a single chamber, called the Sobranje or National Assembly, the members of which are partly elected by universal manhood suffrage, partly nominated by the prince. On the 29th of April, 1879, Prince Alexander of Battenberg, cousin of the Grand-duke of Hesse, was elected prince by unanimous vote of the constituent assembly. In 1885 a national rising took place in Eastern Rumelia, the Turkish governor was expelled, and union with Bulgaria proclaimed. In consequence Servia demanded an addition to her own territory and began a war against Bulgaria (Nov., 1885), in which she was severely defeated. By the treaty which followed, the Prince of Bulgaria was appointed governor-general of Eastern Rumelia for a term of five years, to be renominated at the end of that time by sanction of the great powers. These events greatly irritated Russia, whose agents managed to seduce certain regiments of Bulgarians; and in August, 1886, the prince was seized and carried off, while a proclamation was issued to the effect that he had abdicated. When he was set free on Austrian territory he discovered that the people were still with him, and determined to return. Seeing, however, that his presence would cause an immediate interference on the part of Russia he formally abdicated, Sept. 7, 1886. In 1887 Prince Ferdinand of Saxe-Coburg came to the throne, and on Oct. 5, 1908, declared the state independent of Turkish control. In 1912 Bulgaria joined the other Balkan States in a war against Turkey, and throughout the war it was Bulgaria who was the leader. See *Balkan War*. By the war Bulgaria materially extended her boundaries and power. The population in 1910 was 2,744,283; in 1914, 4,800,000. On October 4, 1915, Russia sent an ultimatum to Bulgaria demanding the dismissal of all Austro-German officers from the Bulgarian army within twenty-four hours and the cessation of negotiations with Germany. Bulgaria ignored the ultimatum, and on October 7, sent an ultimatum to Serbia demanding settlement of the Macedonian controversy within twenty-four hours and protested to Greece against the landing of Allied troops at Salonika. On October 11, Bulgarian armies invaded Serbia and took an active part in the subsequent campaigns against Montenegro and Albania. See *European War*.

**Bulgarians** (bul-gā'ri-ans), a race of Finnish origin, whose original seat was the banks of the Volga, and who subdued the old Mœsian population and established a kingdom in the present Bulgaria in the 7th century. They soon became blended with the conquered Slavs, whose language they adopted. In the 14th century the country was conquered by the Turks, and until recently remained part of the Ottoman Empire. (See *Bulgaria*.) The Bulgarian language is divided into two dialects, the old and the new; the former is the richest and best of the Slavonic tongues, and although extinct as a living tongue is still used as the sacred language of the Greek Church. The Bul-

garians are now spread over many parts of the Balkan peninsula.

**Bulkhead** (bulk'hed), a partition built between portions of the interior of a ship, to separate it into rooms, or as a safeguard in case of wreck.

**Bull** (bụl; Lat. *bulla*, a boss, later a leaden seal), a letter, edict, or rescript of the pope, published or transmitted to the churches over which he is head, containing some decree, order, or decision, and in many cases having a leaden seal attached, impressed on one side with the heads of St. Peter and St. Paul, on the other with the name of the pope. The document is in Latin and on parchment.

**Bull,** the name given to the male of any bovine quadruped. This word is also given to an amusing incongruity in speech, usually applied specially to the Irish people.

**Bull,** JOHN, the English nation personified, and hence any typical Englishman: first used in Arbuthnot's satire, *The History of John Bull*, designed to ridicule the Duke of Marlborough; and in which the French are personified as *Lewis Baboon*, the Dutch as *Nicholas Frog*, etc.

**Bull,** OLE BORNEMANN, a famous violinist, born at Bergen, Norway, in 1810; died in 1880. He secured great triumphs both throughout Europe and in America by his wonderful playing. He lost all his money in a scheme to found a colony of his countrymen in Pennsylvania, and had to take again to his violin to repair his broken fortunes. He afterwards settled down at Cambridge, Mass., and had also a summer residence in Norway, where he died.

**Bulla** (bul'a), or BUBBLE SHELL, a genus of gasteropod molluscs with very thin and almost globular shells. There are numerous species, fossil and living.

**Bullace** (bụl'ăs), a kind of wild plum (*Prunus insititia*) common in many parts of England and naturalized in Massachusetts, used for making jam, etc.

**Bullæ** (bul'lē), or BLEBS, collections of serous fluid of considerable size, which gather under the cuticle and separate it from the true skin. The most familiar examples are the 'blisters' produced on the hands by rowing and on the feet by walking. They appear in various forms of skin disease.

**Bull-baiting,** the barbarous sport of setting dogs on a bull, who is tied to a stake and worried by the dogs for the amusement of the spectators. It was a favorite sport in England from a very early period till it was finally put down by act of parliament in 1835.

**Bull'dog,** a variety of the common dog, remarkable for its short, broad muzzle, and the projection of its lower jaw, which causes the lower front teeth to protrude beyond the upper. The head is massive and broad; the lips are thick and pendulous; the ears pendent at the extremity; the neck robust and short; the body long and stout; and the legs short and thick. The bulldog is a slow-motioned, ferocious animal, better suited for savage combat than for any purpose requiring activity and intelligence. For this reason it is often employed as a watchdog. It was formerly used—as its name implies—for the barbarous sport of bull-baiting.—The *bull terrier* was originally from a cross between the bulldog and the terrier. It is smaller than the bulldog, lively, docile, and very courageous.

**Bullen,** ANNE. See *Boleyn*.

**Bul'ler,** SIR REDVERS HENRY, a British soldier, born in Devonshire in 1839. He entered the army in 1858, rising in rank from lieutenant in 1862 to lieutenant-general in 1891. He served in all the wars from 1860 onward, and defeated the Arabs at Abu Klea, in the Sudan, in 1885. In 1890 he succeeded Lord Wolseley as adjutant-general of the army. In 1899 he took command of the forces in the Boer war, but being defeated at Tugela River, Natal, was superseded by Lord Roberts. Died in 1908.

**Bullet** (bul'et), in modern usage a projectile partially encased in a metallic cartridge and fired from a rifle or pistol. Present-day military practice has resulted in the adoption of an elongated bullet composed of a lead core cased in a harder metal, such as nickel. The diameter of the bullet is small, as is exemplified in the service rifle of the British army, the Lee-Enfield, which has a diameter of .303 in., weighs 215 grains and is coated with Cupro-nickel. The bullet used in the United States army is the Spitser, a sharp-pointed bullet, .308 in. diameter, weighing 150 grains. The bullet used in sporting rifles is much the same as that used in the military arm. The type used in the Express rifle had a hollow point to insure the expansion of the projectile on impact, and in this rifle particularly the bullets were sometimes filled with a detonating powder. Their use is now abandoned and is prohibited in warfare by international law. The dumdum bullet, named from the Dumdum

ammunition works at Calcutta, was a half-covered bullet with an expansible soft core. The soft-nose bullet is one in which the nose is made of softer metal than the rest, so that it flattens out or mushrooms on impact.

**Bulletin** (bụl'e-tin), an authenticated official report concerning some public event, such as military operations, or the health of a distinguished personage, issued for the information of the public.

**Bullet-tree,** or BULLY-TREE (*Mimūsops balāta* or *Sapōta Mullĕri*), a forest tree of Guiana and neighboring regions, order Sapotaceæ, yielding an excellent gum (the concreted milky juice) known as *balata*, having properties giving it in some respects an intermediate position between gutta-percha and India rubber, and making it for certain industrial purposes more useful than either. In the United States it is used as a chewing material. The timber of the tree also is valuable.

**Bull-fights** are among the favorite diversions of the Spaniards. They are usually held in an amphitheater having circular seats rising one above another, and are attended by vast crowds who eagerly pay for admission. The combatants, who make bull-fighting their profession, march into the arena in procession. They are of various kinds—the *picadores*, combatants on horseback, in the old Spanish knightly garb; the *chulos* and *banderilleros*, combatants on foot, in gay dresses, with colored cloaks or banners; and finally, the *matador* (the killer). As soon as the signal is given the bull is let into the arena. The *picadores*, who have stationed themselves near him, commence the attack with their lances, and the bull is thus goaded to fury. Sometimes a horse is wounded or killed (only old, worthless animals are thus employed), and the rider is obliged to run for his life. The *chulos* assist the horsemen by drawing the attention of the bull with their cloaks; and in case of danger they save themselves by leaping over the wooden fence which surrounds the arena. The *banderilleros* then come into play. They try to fasten on the bull their *banderillas*—barbed darts ornamented with colored paper, and often having squibs or crackers attached. If they succeed, the squibs are discharged, and the bull races madly about the arena. The *matador* or *espada* now comes in gravely with a naked sword, and a red flag to decoy the bull with, and aims a fatal blow at the animal. The slaughtered bull is dragged away, and another is let out from the stall. Several bulls are so disposed of in a single day.

**Bull'finch,** or BULFINCH, an insessorial bird, *Pyrrhŭla rubicilla*, family Fringillidæ, or finches, with short, thick, rounded bill, beak and crown of the head black, body bluish-gray above and bright tile-red below. It is found in the middle and south of Europe, and in Asia, and when tamed may be taught to sing musical airs. *P. synoica* is an Asiatic species, and *P. cineriola* an inhabitant of Brazil.

**Bull'frog,** the *Rana pipiens*, a large species of frog found in North America, 8 to 12 inches long, of a dusky-brown color mixed with a yellowish green, and spotted with black. These frogs live in stagnant water, and utter a low croaking sound resembling the lowing of cattle, whence the name.

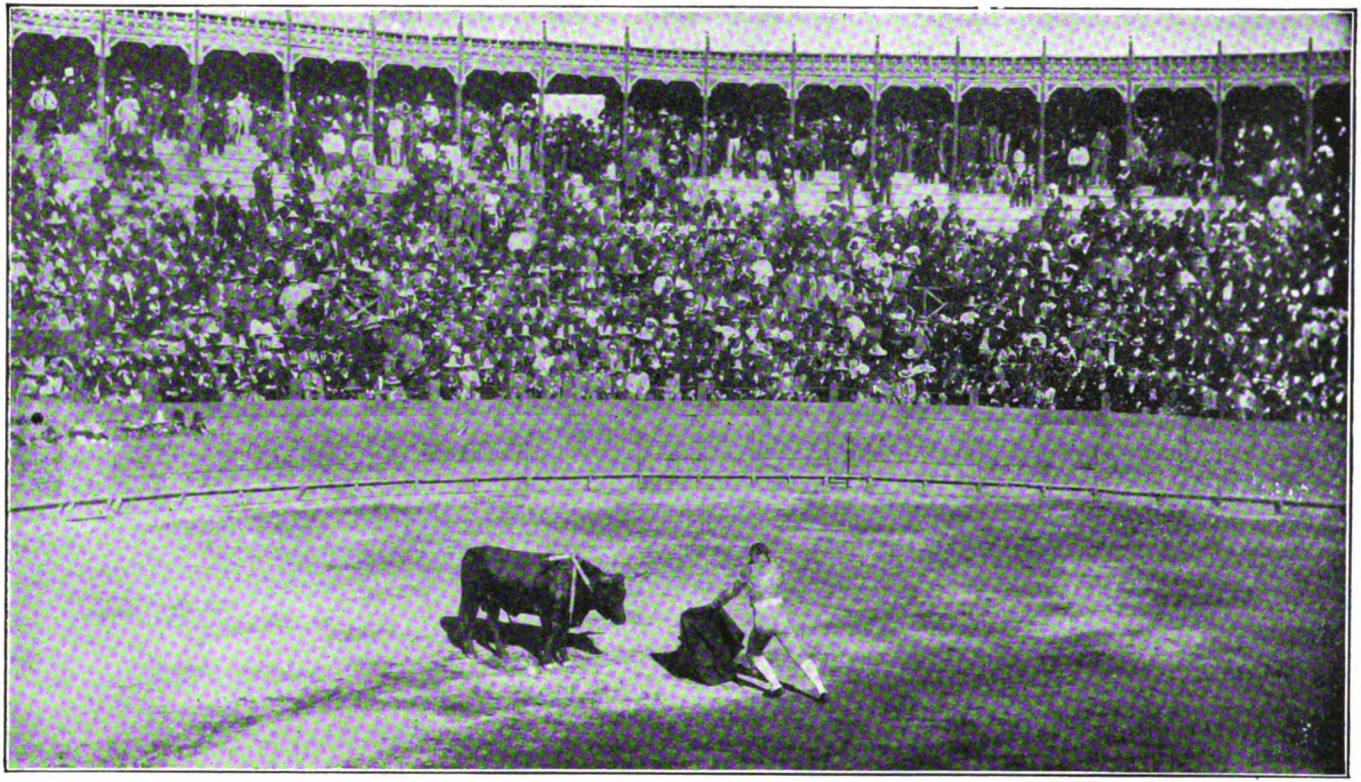
**Bull'head,** the popular name of certain fishes. One of these, the *Cottus gobio*, an European fish, is about 4 inches long, with head very large and broader than the body. It is often called also *Miller's thumb*. The armed bullhead is the *Aspidophŏrus Europæus*, found in the Baltic and northern seas; the six-horned bullhead (*C. hexacornis*) is a North American species. In America this name is given to a species of *Pimelŏdus*, called also *catfish* and *horned pout*.

**Bullinger** (bụl'ing-ẽr), HENRY, a celebrated Swiss reformer, born in 1504; died at Zurich in 1575. He was the intimate friend of Zuinglius, whom he succeeded in 1531 as pastor of Zurich. He kept up a close correspondence with the principal English reformers. The *Zurich Letters*, published by the Parker Society, contains part of this correspondence, and among others, letters addressed to him by Lady Jane Grey. He wrote numerous theological works.

**Bullion** (bụl'yun) is uncoined gold or silver, in bars, plate, or other masses, but the term is frequently employed to signify the precious metals coined and uncoined.

**Bull Run,** a stream in the N. E. of Virginia, flowing into the Occoquan river, 14 miles from the Potomac; the scene of two great battles of the Civil War in which the Federals were defeated—one, July 21, 1861, the other, August 29-30, 1862. By the Confederates these battles were called Manassas, after a near-by railway junction.

**Bulls and Bears,** in stock-exchange slang, manipulators of stocks; the former operating in order to effect a rise in price, the latter



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**A MEXICAN BULL FIGHT**

**The last act in a bull fight, City of Mexico. The bull, tired out by the attacks of the *picadores* or pikemen, and *banderilleros* or dart men, whose *banderillas* or darts are seen planted in the bull's shoulders, faces the *matador*, armed with the *estoque* or sword, and carrying the *muleta* or red flag in his left hand, and about to deliver the death stroke.**

doing all they can to bring prices of stock down.

**Bull's-eye,** (1) a round piece of thick glass, convex on one side, inserted into the decks, ports, scuttle-hatches, or skylight-covers of a vessel for the purpose of admitting light. (2) A small lantern with a lens in one side of it to concentrate the light in any desired direction. (3) In *rifle shooting*, the center of a target, of a different color from the rest of it and usually round. (4) In architecture, a round window, usually in a mansard roof.

**Bull-trout,** a large species of fish of the salmon family, the *Salmo eriox*, thicker and clumsier in form than the salmon, but so like it as sometimes to be mistaken for it by fishers. It attains a weight of 15 to 20 lbs., and lives chiefly in the sea, ascending rivers to spawn. Its scales are smaller than those of the salmon, and its color less bright.

**Bully-tree.** See *Bullet-tree.*

**Bülow** (bü'lō) BERNHARD VON, COUNT, born in Germany in 1850, son of Herr von Bülow, foreign secretary under Bismarck 1873-79. He was successively secretary of embassy at Rome, St. Petersburg, and Vienna and *chargé d'affaires* in Greece; was appointed Minister to Roumania in 1888, to Italy in 1893, foreign secretary in 1897, and minister for foreign affairs in 1898. In 1900 he was appointed chancellor of the empire, holding this position until 1909.

**Bülow,** FRIEDRICH WILHELM VON, a Prussian general, born in 1755; died in 1816. He was actively engaged against the French at the earliest periods of the revolutionary war; and his services in 1813 and 1814, especially at Grosbeeren and Dennewitz, were rewarded with a Grand Knightship of the Iron Cross and the title Count Bülow von Dennewitz. As commander of the fourth division of the allied army he contributed to the victorious close of the battle of Waterloo.

**Bülow,** HANS GUIDO VON, pianist and composer, born at Dresden in 1830; was intended for a lawyer, but adopted music as a profession. He studied the piano under Liszt, and made his first public appearance in 1852. In 1855 he became the leading professor in the conservatory at Berlin; in 1858 was appointed court pianist; and in 1867 was made musical director to the King of Bavaria. His compositions include overture and music to *Julius Cæsar*, *The Minstrel's Curse*, and *Nirwana;* songs, choruses, and pianoforte pieces. He is considered one of the first of pianists and orchestral conductors, but was very irascible. He died in 1894.

**Buloz** (bü-loz), FRANÇOIS, born near Geneva, Switzerland, in 1803; died at Paris in 1877; founder and editor of the *Revue des Deux Mondes*, the celebrated French fortnightly literary magazine.

**Bulrampur** (bul-rām-pur'), a town of Oude, India; the largest town in the Gonda district, and the residence of the Maharajah of Bulrampur. Pop. about 15,000.

**Bulrush** (bul'rush), the popular name for large rush-like plants growing in marshes, not very definitely applied. Some authors apply the name to *Typha latifolia* and *T. angustifolia* (cat's-tail or reed-mace). But it is more generally restricted to *Scirpus lacustris*, a tall, rush-like plant from which the bottoms of chairs, mats, etc., are manufactured. The bulrush of Egypt (Ex., ii, 3) is the *Juncus globulōsus.*

**Bulsar** (bul-sär'), a port and town in Surat district, Bombay, on the estuary of the Auranga. Exports timber, and manufactures cloth, bricks, tiles, and pottery. Pop. 13,229.

**Bulund'shahur.** See *Bulandshahr.*

**Bulwark** (bul'wark), an old name for a rampart or bastion.

**Bulwer** (bul'wèr), SIR HENRY LYTTON, LORD DALLING and BULWER, diplomatist and author, elder brother of Lord Lytton; born in 1804; died in 1872. He was attached to the British embassies at Berlin, Brussels, and the Hague from 1827 to 1830, when he entered parliament. In 1837 he was sent as secretary of legation to Constantinople; subsequently he was minister at Madrid and Washington, and he succeeded Lord Stratford de Redcliffe as ambassador at the Porte (1858-65). He wrote *France, Social, Literary and Political; Life of Byron; Life of Palmerston; Historical Characters*, etc. He was raised to the peerage in 1871.

**Bulwer Lytton.** See *Lytton, Lord.*

**Bum'ble-Bee.** See *Bee.*

**Bumboat,** a small boat used to sell vegetables, etc., to ships lying at a distance from shore.

**Bummalo** (bum'a-lō), BUMMALO'TI, the Indian name for a small, glutinous, transparent fish, about the size of a smelt, found on the coasts of Southern Asia, which, when dried, is much used as a relish by both Europeans and Indians and facetiously called *Bombay duck.* It is the *Saurus ophiödon*, family Scopelidæ.

**Buncombe,** BUNKUM (bung'kum), a county in North Carolina; area 624 sq. m. Pop. 49,795. The term *Bunkum*, meaning talking for talking's sake, bombastic speech-making, originated in the 16th Congress, when the 'Missouri Question' was being discussed. Felix Walker, congressman from Buncombe County, persisted in making a speech when the house was impatient to vote. When implored to desist he declared that he was only talking for *Buncombe*, whence the term.

**Bundelcund** (bun-del-kund'; more correctly BUNDELKHAND), a tract of country in Upper India lying between the river Jumna on the N., and the Chambal on the N. and W.; area 20,559 sq. m. It comprises the British districts of Hamirpur, Jalaun, Jhânsi, Lalitpur, and Banda, and thirty-one native states. In it are the diamond mines of Punnah.

**Bunder-Abbas.** See *Bender-Abbas.*

**Bundesrath** (bun'des-rät), the German federal council which represents the individual states of the empire, as the *Reichstag* represents the German nation. It consists of sixty-two delegates, and its functions are mainly those of a confirming body, although it has the privilege of rejecting measures passed by the Reichstag.

**Bundi** (bön'di). See *Boondee.*

**Bungalow** (bun'ga-lō), in India, a house or residence, generally of a single floor. Native bungalows are constructed of wood, bamboos, etc.; but those erected by Europeans are generally built of sun-dried bricks, and

Bungalow on Penang Hills.

thatched or tiled, and are of all styles and sizes, but invariably surrounded by a veranda. Within recent years the building of similar rustic dwellings, for summer resort, has become common in the United States.

**Bungay** (bun'gā), a market town of England, County Suffolk, on the right bank of the Waveney, 30 miles N. E. of Ipswich. It contains the ruins of an ancient castle, a stronghold of the Bigods, earls of Norfolk. Pop. (1911) 3359.

**Bunion** (bun'yun), an enlargement and inflammation of the joint of the great toe arising from irritation to the small membranous sac called *bursa mucosa.*

**Bu'nium.** See *Earthnut.*

**Bunk,** a wooden box or case serving as a seat during the day and a bed at night; also one of a series of sleeping berths arranged above each other.

**Bunk'er Hill,** a small eminence in Charlestown, now a part of Boston, Massachusetts; the scene of the first important battle in the Revolutionary war, fought June 17, 1775. A considerable body of Americans having been sent to occupy the peninsula on which Charlestown stands, a British force was sent to dislodge them. This was not effected till after three assaults on their intrenched position, with a loss of 1000 men, while the Americans did not lose half that number.

**Bun'kum.** See *Buncombe.*

**Bunsen** (bun'sen), CHRISTIAN KARL JOSIAS, CHEVALIER, a distinguished German diplomatist and scholar, was born at Korbach, in the principality of Waldeck, in 1791; died in 1860. In 1815 he made the acquaintance of Niebuhr, who shortly after procured for him the post of secretary to the Prussian embassy at Rome. In 1824 he was appointed chargé d'affaires, and afterwards minister. After a stay of twelve years in Rome he was sent, as Prussian minister, first to Switzerland, and then to England, where he remained till the breaking out of the Eastern difficulty in 1854. In his official capacity he won the esteem of all, and with Britain especially he was connected by many ties. His later years were spent at Heidelberg and at Bonn exclusively in literary pursuits. Among his best-known works are *Die Verfassung der Kirche der Zukunft* ('The Constitution of the Church of the Future'), Hamburg, 1845; *Aegyptens Stelle in der Weltgeschichte* ('Egypt's Place in the World's History'), Hamburg, 1845; *Hippolytus und seine Zeit* ('Hippolytus and his Time'), London, 1851, and finally, his greatest work, *Bibelwerk für die Gemeinde* ('Bible Commentary for the Community'), the publication of which was unfinished at his death. His *Memoirs*, by his widow, were published in 1868.

**THE BATTLE OF BUNKER HILL**

June 17, 1775. In the foreground is seen the dying General Warren. The American forces, under Prescott, Putnam and Stark, lost 450 killed, and the British under Howe and Pigott, 1050.

**Bunsen,** ROBERT WILHELM EBERARD, an eminent German chemist, born at Göttingen in 1811; died in 1899. He studied at Göttingen University, and at Paris, Berlin, and Vienna; was appointed professor at the Polytechnic Institute of Cassel, 1836; at the University of Marburg in 1838, at Breslau in 1851, and finally professor of Experimental Chemistry at Heidelberg in 1852. Among his many discoveries and inventions are the production of magnesium in quantities, magnesium light, spectrum analysis, and the electric pile and burner bearing his name.

**Bunsen's Battery,** a form of galvanic battery, the cells of which consist of cleft cylinders of zinc immersed in dilute sulphuric acid, and rectangular prisms of carbon in nitric acid, with an intervening porous cell of unglazed earthenware.

**Bunsen's Burner,** a form of gas burner especially adapted for heating, consisting of a tube, in which, by means of holes in the side, the gas becomes mixed with air before consumption, so that it gives a non-illuminating smokeless blue flame.

**Bunt,** sometimes called *Smut Ball*, *Pepper Brand*, and *Brand Bladders*, a fungoid disease incidental to cultivated corn, consisting of a black, powdery matter, having a disagreeable odor, occupying the interior of the grain of wheat and a few other Gramineæ. This powdery matter consists of minute balls filled with sporules, and is caused by the attack of *Tilletia caries*, a kind of mold.

**Bunter Sandstein** (bun'ter zänt'shtīn; 'variegated sandstone'), a German name for the new red sandstone, the lowest group of the Triassic system.

**Bunt'ing,** the popular name of a number of insessorial birds, family Emberizidæ, chiefly included in the genus *Emberiza;* such as the English or common bunting; the rice-bunting; the Lapland, snow, blackheaded, yellow, cirl, and ortolan buntings. The yellow bunting or yellow hammer (*E. citrinella*) is one of the most common British birds. The common or corn bunting (*E. miliaria*) is also common in cultivated districts. The snow-bunting (*Plectrophănes nivālis*) is one of the few birds which cheer the solitudes of the polar regions.

**Bunt'ing,** a thin woolen stuff, of which the colors and signals of a ship are usually formed; hence, a vessel's flags collectively.

**Bun'ya-Bun'ya,** the native Australian name of the *Araucaria Bidwillii*, a fine Queensland tree with cones larger than a man's head, containing seeds that are eagerly eaten by the blacks.

**Bun'yan,** JOHN, author of *The Pilgrim's Progress*, was the son of a tinker, and was born at the village of Elstow, near Bedford, in 1628; died at London in 1688. He followed his father's employment, but during the civil war he served as a soldier. Returning to Elstow, after much mental conflict his mind became impressed with a deep sense of the truth and importance of religion. He joined a society of Anabaptists at Bedford, and at length undertook the office of a public teacher among them. Acting in defiance of the severe laws against dissenters, Bunyan was detained in prison for twelve years (1660–72), but was at last liberated, and became pastor of the community with which he had previously been connected. During his imprisonment he wrote *Profitable Meditations*, *The Holy City*, etc., and also the curious piece of autobiography entitled *Grace Abounding to the Chief of Sinners*. In 1675 he was sent to prison for six months under the Conventicle Act. To this confinement he owes his chief literary fame, for in the solitude of his cell he produced the first part of that admired religious allegory, the *Pilgrim's Progress*. His *Holy War*, his other religious parables, and his devotional tracts, which are numerous, are also remarkable, and many of them valuable. On obtaining his liberty Bunyan resumed his functions as a minister at Bedford, and became extremely popular. He died when on a visit to London.

**Bunzlau** (bụnts'lou), a town of Prussia, province of Silesia, 28 miles W. of Liegnitz. Industries: woolen and linen, pottery. Pop. 14,590. —*Jung-Bunzlau* is a town of Bohemia, 31 miles N. E. of Prague, with 16,340 inhabitants. There is a smaller Bohemian town called *Alt-Bunzlau*.

**Buonaparte.** See *Bonaparte*.

**Buonarroti** (bụ-o-nâr-rot'ē), MICHAEL ANGELO, of the ancient family of the counts of Canossa, born at Caprese, Tuscany, in 1475; died at Rome in 1563; a distinguished Italian painter, sculptor, architect, and poet. He studied drawing under Domenico Ghirlandaio, and sculpture under Bertoldo at Florence, and having attracted the notice of Lorenzo de' Medici, was for several years an inmate of his household. Having distinguished himself both in sculpture and

painting, he was commissioned (together with Leonardo da Vinci) to decorate the senate-hall at Florence with a historical design, but before it was finished, in 1505, he was induced by Pope Julius II to settle in Rome. Here he sculptured the monument of the pontiff (there are seven statues belonging to it) now in the church of St. Pietro in Vincoli; and painted the dome of the Sistine Chapel, his frescoes representing the creation and

Michael Angelo Buonarroti

the principal events of sacred history. In 1530 he took a leading part in the defense of Florence against Charles V. Three years later he began his great picture in the Sistine Chapel, the *Last Judgment*, which occupied him eight years. His last considerable works in painting were two large pictures: the *Conversion of St. Paul* and the *Crucifixion of St. Peter* in the Pauline Chapel. In sculpture he executed the *Descent of Christ from the Cross*, four figures of one piece of marble. His statue of *Bacchus* was thought by Raphael to possess equal perfection with the masterpieces of Phidias and Praxiteles. As late as 1546 he was obliged to undertake the continuation of the building of St. Peter's, and planned and built the dome, but he did not live long enough to see his plan finished, and many alterations were made in it after his death. Besides this, he undertook the building of the Piazza del Campidoglio (Capitol), of the Farnese Palace, and of many other edifices. His style in architecture is distinguished by grandeur and boldness, and in his ornaments the untamed character of his imagination frequently appears, he preferring the uncommon to the simple and elegant. His poems, which he considered merely as pastimes, contain, likewise, convincing proofs of his great genius. His prose works consist of lectures, speeches, etc.

**Buoy** (boi), any floating body employed to point out the particular situation of a ship's anchor, a shoal, the direction of a navigable channel, etc. They are made of wood, or now more commonly of wrought-iron plates riveted together and forming hollow chambers. They are generally moored by chains to the bed of the channel, etc. They are of various shapes, and receive corresponding names: thus there are the *can*-buoy, the *spar*-buoy, the *bell*-buoy, the *whistling*-buoy, etc. Gas-lighted buoys have come into use with the introduction of calcium carbide for lighting purposes. The acetylene gas produced in these buoys is controlled by an automatic generator, so that all the carbide of a given charge is consumed.

**Buphaga** (bū'fa-ga), a genus of insessorial African birds, family Sturnidæ (starlings). See *Beef-eaters*.

**Buprestidæ** (bū-pres'ti-dē), a family of beetles, distinguished by the uncommon brilliancy and highly metallic splendor of their colors.

**Burbage** (bur'baj), RICHARD, a famous actor and contemporary of Shakespere, was the son of James Burbage (died 1597), also an actor, and the first builder of a theater in England. He was born about 1567; died in 1619. He was a member of the same company as Shakespere, Fletcher, Hemming, Condell, and others, and filled all the greatest parts of the contemporary stage in turn. He was the original *Hamlet*, *Lear*, *Othello*, and *Richard III*, and played the leading parts in the plays of Beaumont and Fletcher, Ben Jonson, Webster, Marston, etc. Besides being an eminent actor, he seems to have been also a successful painter in oil colors.

**Burbank,** LUTHER, horticulturist, was born at Lancaster, Massachusetts, in 1849. The son of a farmer, he became deeply interested in plant life, and engaged in experiments on hybridization of plants. Removing to California, he established the Burbank Exposition Farms at Santa Rosa, where he undertook the work of cross-breeding on an extended scale. He originated a new fruit, the plumcot, by combining the plum and the apricot, produced an edible thornless cactus, developed the Burbank potato and Burbank cherry, varieties of great excellence; a white blackberry, various new apples, stoneless prunes, also new peaches, nuts, roses, callas, violet-odored lilies, and many other new varieties. In 1905 the Carnegie Institution granted him $10,000 yearly for ten years to continue his work. He has very many extensive experiments under

WHITE BLACKBERRY

**THE SPINELESS CACTUS IN FRUIT**

These remarkable plants have been developed by the great horticulturist, Luther Burbank, of California. The white blackberry grows thickly, is large in size, and the taste is similar to that of the ordinary variety. The spineless cactus makes an excellent cattle food.

way and has nearly 3000 distinct botanical specimens in his plantation.

**Burbot** (bur'bot), or BURBOLT, a fish of the cod family, genus *Lota* (*L. vulgaris*), shaped somewhat like an eel, but shorter, with a flat head. It has two small barbs on the nose and another on the chin. It is called also *Eelpout* or *Coney-fish*, and is said to arrive at its greatest perfection in the Lake of Geneva. It is delicate food. The spotted burbot is found in the northern lakes and rivers of N. America.

**Burckhardt** (burk'hart), JOHANN LUDWIG, a noted traveler, born at Lausanne in 1784; died at Cairo in 1817. He undertook a journey of exploration to the interior of Africa for the African Association in 1809, assuming an Oriental name and costume; spent some time in Syria, thence visited Egypt and Nubia; spent several months at Mecca, and visited Medina; and after a short stay in Egypt died at Cairo while preparing for his African journey. His works are: *Travels in Nubia* (1819); *Travels in Syria and the Holy Land* (1822); *Travels in Arabia* (1829); *Notes on the Bedouins and Wahabys* (1830); and *Arabic Proverbs* (1831).

**Burdekin** (bur'dē-kin), a river of the N. E. of Queensland, with a course of about 350 miles. With its affluents it waters a large extent of country, but it is useless for navigation.

**Burdett** (bur'det), SIR FRANCIS, an English politician, born in 1770, died in 1844. In 1796 he entered parliament as member for Boroughbridge, and advocated parliamentary reform and various liberal measures. He afterwards sat for Middlesex and in 1807–37 for Westminster. In 1810 he was convicted of breach of privilege, and after a struggle between the police and the populace, in which some lives were lost, he was imprisoned in the Tower. In 1819 he was again imprisoned, and fined £2000 for a libel. In his later years he became a Tory, and represented North Wilts. In 1793 be married the youngest daughter of Thomas Coutts the banker.

**Burdett-Coutts** (köts), ANGELA GEORGINA, daughter of the above, born in 1814, became deservedly popular for the liberal use she made of the immense wealth she inherited from her grandfather (Thomas Coutts) in public and private charities. In 1871 she received a peerage from the government, and in 1881 married a Mr. Ashmead-Bartlett, who assumed the name of Burdett-Coutts. She died in 1906.

**Bur'dette,** ROBERT JONES, humorist, born at Greensborough, Pennsylvania, in 1844. He was in the Union army 1862–65, became an editor on the Burlington *Hawkeye* and later on the Brooklyn *Eagle*. In 1887 he was ordained a Baptist clergyman and in 1903 he was called to an important charge in Los Angeles, California. His humorous productions took the form of magazine contributions, lectures, and speeches. He died November 19, 1914.

**Burdock** (bur'dok), the popular name of the composite plant *Arctium lappa*, a coarse-looking weed with globose flower-heads, the scales of the involucre each furnished with a hook. Burdocks are usually regarded as troublesome weeds, but in some countries the roots, young shoots, and young leaves are used in soups, and the plant is cultivated with this view in Japan. It is common in the United States.

**Burdwan** (burd'-wän). See *Bardwan*.

**Bureau** (bū'rō), in the United States a chest of drawers; in France a writing table or desk; also a government department. In the United States the term signifies certain subdivisions of an executive department, as the bureau of statistics, a division of the treasury department. *Bureaucracy* is a term applied to those governments in which the business of the administration is carried on by departments, each under the control of a chief, responsible to his administrative superior but not amenable to the common law of the land.

**Bureau** OF PAN-AMERICAN UNION, formerly the International Bureau of American Republics. A bureau established at Washington as an outcome of the Pan-American Conference of 1890, its purpose being to keep the republics of this continent in close touch with one another in regard to commercial and other interests, and thus promote fraternal relations between them.

**Burette** (bū-ret'), a glass tube usually graduated to fractions of a centimeter, used for dividing a given portion of any liquid into small quantities of a definite amount or to gauge the amount of liquid to be allowed to enter another liquid; used in chemical work.

**Burg** (börg), a town of Prussia, province of Saxony, 14 miles N. E. of Magdeburg. It has cloth manufactures, boot industries, etc. Pop. 22,434.

**Burgage Tenure** (bur'gaj), in England a tenure in socage, whereby burgesses, citizens, or townsmen hold their lands or tenements of the king or other lord for a certain yearly rent. In Scotland the term indicates that tenure by which the property in royal burghs is held under the crown,

proprietors being liable to the (nominal) service of watching and warding, or, as it is commonly termed, 'service of burgh, used and wont.'

**Burgas** (bŭr-gäs), or BOURGAS, a town on the Black Sea, in Eastern Rumelia. Pop. 11,073.

**Burger** (bŭr'gėr), GOTTFRIED AUGUST, a celebrated German poet, born Jan. 1, 1748; died in 1794. He studied at Halle and Göttingen; and his attention being drawn towards literature, especially the ballad literature of England and Scotland, he was inspired with the idea of winning a reputation in this department where Uhland and Schiller had already preceded him. In 1773 appeared his *Lenore*, which took the German public by storm, and his poems have continued to be very popular with his countrymen. Scott translated his *William and Helen* and the *Wild Huntsman*. Though he wrote odes, elegies, etc., he is more at home in ballads and simple songs than in higher poetry. His life was not a successful or a happy one.

**Burgess** (bur'jes), a magistrate of a borough. In Pennsylvania a burgess for a borough performs the same duties as a mayor for a city.

**Bur'gess,** JAMES, an English archæologist, born in 1832. In 1855 he became professor of mathematics at Calcutta. He was appointed director of the archæological survey of Western India in 1873 and of all India in 1886. He published a number of superbly illustrated volumes on *The Rock Temples of Elephanta, The Cave Temples of India, Mohammedan Architecture of Gujarat*, etc.

**Burgh** (bur'ō), the Scotch term corresponding to the English 'borough' and applied to several different kinds of town corporations. A *royal burgh* is a corporate body erected by a charter from the crown. The corporation consists of the magistrates and burgesses of the territory erected into the burgh. The magistrates are generally a provost and bailies, dean of guild, treasurer, and common council. The royal burghs now number sixty-six, most of them singly or in groups electing parliamentary representatives, though others have lost this privilege,—*Burghs of Barony* are corporations analogous to royal burghs, the magistrates of which are elected either by the superior of the barony or by the inhabitants themselves, according to the terms of the charter of erection.—*Burghs of Regality* were a kind of burghs of barony which had regal or exclusive jurisdiction within their own territory till the abolition of hereditary jurisdictions.—*Parliamentary Burghs* are such as, not being royal burghs, send representatives to parliament. There are fifteen of these, namely, Airdrie, Cromarty, Falkirk, Galashiels, Greenock, Hamilton, Hawick, Kilmarnock, Leith, Musselburgh, Oban, Paisley, Peterhead, Port-Glasgow, and Portobello. The mode of election of councilors and magistrates of parliamentary burghs is the same as in royal burghs.—*Police Burghs* are populous places, the boundaries of which are settled in terms of the Police Act of 1862, and the affairs of which are managed by commissioners elected under the act by the inhabitants.

**Burghers** (bur'gėrz), a body of Presbyterians in Scotland, constituting the majority of the early Secession Church, which was split into two in 1747 on the lawfulness of accepting the oath then required to be taken by the burgesses in certain burghs. The Burghers accepted the oath, while the Antiburghers did not deem it lawful.

**Burgh'ley,** BUR'LEIGH. See *Cecil*.

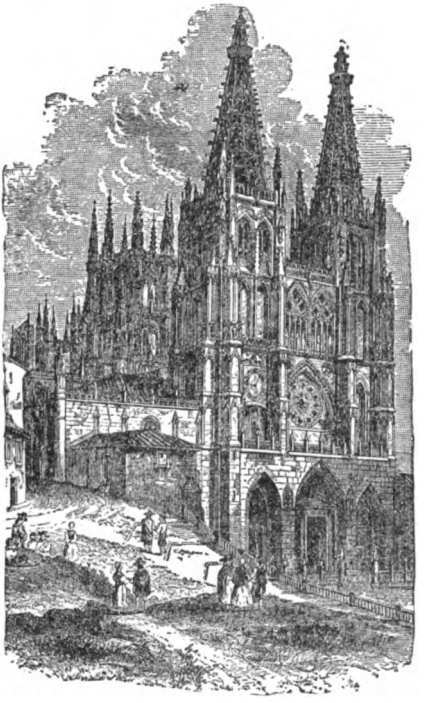
**Burgkmair** (bŭrk'mīr), a family of German artists in the 15th and 16th centuries, the best known of whom is Hans, born at Augsburg in 1472. Several of his paintings are to be seen at Augsburg, Munich, Nürnberg, etc., but these have contributed far less to his fame than his woodcuts, which are not inferior to those of his friend Albert Dürer. The most celebrated is the series of 135 cuts representing the *Triumph of the Emperor Maximilian*. He is supposed to have died in 1559.

**Burglary** (burg'la-ri; derived from the French *bourg*, a town, and old French *laire*, L. *latro*, a thief) is defined in law to be a breaking and entering the dwelling-house of another, in the night, with intent to commit some felony within the same, whether such felonious intent be executed or not. Both breaking and entering are considered necessary to constitute the offense. The laws of different countries differ in their conception of burglary. An Act of Congress of 1825 includes breaking into ships and vessels as burglary; and in some States breaking into shops, factories, warehouses, offices, and places of divine worship is also included. Burglary is a felony in all the States, and in North Carolina it may be punished with death or by imprisonment. In the United States, as a whole, the maximum penalty is twenty years' imprisonment.

**Burgomaster** (bur'gō-mas-tėr), the chief magistrate of a municipal town in the Netherlands and

Germany. The title is equivalent to our *mayor* and the Scotch *provost*.

**Burgos** (bur'gos), a city of Northern Spain, once the capital of the kingdom of Old Castile, and now the chief town of the province of Burgos. It stands on the declivity of a hill on the right bank of the Arlanzon, and has dark, narrow streets lined by ancient architecture, but there are also fine promenades in the modern style. The cathedral, commenced in 1221, is one of the finest examples of Gothic architecture in Spain. It



Burgos Cathedral, West Front.

contains the tombs of the famous Cid and of Don Fernando, both natives of Burgos, and celebrated throughout Spain for their heroic achievements in the wars with the Moors. Before the removal of the court to Madrid, in the 16th century, Burgos was in a very flourishing condition, and contained thrice its present population. It has some manufactures in woolens and linens. Pop. 30,167.—The province has an area of 5650 sq. miles, largely hilly or mountainous, but with good agricultural and pastoral land. Pop. 388,828.

**Burgoyne** (bur-goin'), JOHN, an English general officer and dramatist; born in 1722; died in 1792. After serving in various parts of the world, he was in 1777 appointed commander of an army against the patriot Americans, and took Ticonderoga, but had at last to surrender with his whole army at Saratoga to a much superior American force, a victory which greatly strengthened the position of the Americans and led to the alliance with France. Burgoyne was ill received on his return to England, and deprived of his command of the 76th Light Dragoons and the governorship of Fort William, but Fox and Sheridan took his part and received his parliamentary support. Subsequently he occupied himself mainly with the writing of comedies, including *The Maid of the Oaks*, *Bon Ton*, and *The Heiress*, a play that still holds the stage.

**Burgoyne,** SIR JOHN FOX, son of the above, an eminent officer of engineers, was born 1782. Entering the Royal Engineers he served in Malta, Sicily, Egypt, and, with Sir John Moore and Wellington, in the Peninsula from 1809 to 1814, and was present at all the sieges, generally as first or second in command of the engineers. In 1851 he was made a lieutenant-general, and was chief of the engineering department at Sebastopol till recalled in 1855. In the following year he was created a baronet, and in 1868 a field-marshal. He died October 7, 1871.

**Burgundy** (bur'gun-di), a region of Western Europe, so named from the Burgundians, a Teutonic or Germanic people originally from the country between the Oder and the Vistula. They migrated first to the region of the Upper Rhine, and in the beginning of the fifth century passed into Gaul and obtained possession of the southeastern part of this country, where they founded a kingdom having its seat of government sometimes at Lyons, and sometimes at Geneva. They were at last wholly subdued by the Franks. In 879 Boson, Count of Autun, succeeded in establishing the royal dignity again in part of this kingdom. He styled himself King of Provence, and had his residence at Arles. His son Louis added the country beyond the Jura, and thus established *Cisjuran Burgundy*. A second kingdom arose when Rudolph of Strettlingen formed *Upper* or *Transjuran Burgundy* out of part of Switzerland

and Savoy. Both these Burgundian kingdoms were united, and finally, on the extinction of Rudolph's line, were incorporated with Germany. But a third state, the historical DUCHY OF BURGUNDY, consisting principally of the French province of Bourgogne or Burgundy, had been formed as a great feudal and almost independent province of France in the ninth century. This first ducal line died out with a Duke Philip, and the duchy, reverting to the crown, was, in 1363, granted by King John of France to his son Philip the Bold, who thus became the founder of a new line of dukes of Burgundy. A marriage with Margaret, daughter of Louis III, Count of Flanders, brought him Flanders, Mechlin, Antwerp, and Franche-Comté. He was succeeded by his son Duke John the Fearless, whose son and successor, Philip the Good, so greatly extended his dominions that on his death in 1467 his son Charles, surnamed the Bold, though possessing only the title of duke, was in reality one of the richest and most powerful sovereigns of Europe. (See *Charles the Bold.*) Charles left a daughter, Mary of Burgundy, the sole heiress of his states, who by her marriage to Maximilian of Austria transferred a large part of her dominions to that prince, while Louis XI of France acquired Burgundy proper as a male fief of France. Burgundy then formed a province, and is now represented by the four departments of Yonne, Côte-d'Or, Saône-et-Loire, and Ain. It is watered by a number of navigable rivers, and is one of the most productive provinces in France, especially of wines. See *Burgundy Wines.*

**Burgundy Pitch,** a resin obtained from the Norway spruce (*Abies excelsa*) and several other pines. It is used in medicine as a stimulating plaster. It takes its name from Burgundy in France, where it was first prepared.

**Burgundy Wines** are produced in the former province of Burgundy, especially in the department of Côte-d'Or, and in richness of flavor and all the more delicate qualities of the juice of the grape they are inferior to none in the world. Amongst the red wines of Burgundy the finest are the Chambertin, the Clos Vougeot, Romanée-Conty, etc.

**Burhampur** (b u r-a m-p ŏ r'). See *Berhampur.*

**Burhánpur** (bur-an-pŏr'), a town of India, Central Provinces, formerly the capital of Kandeish, and famous for its muslin and flowered silk manufactures, which still exist to some extent, though the town has long been declining. Pop. 30,017.

**Burial** (ber'i-al), the mode of disposing of the dead, a practice which varies amongst different peoples. Amongst savage races, and even amongst some cultured peoples of the East, exposure to wild animals or birds of prey is not uncommon. The careful embalmment of their dead by the ancient Egyptians may be regarded as a special form of burial. But by far the most common modes of disposing of the dead have been burning and interring. Amongst the Greeks and Romans both forms were practised, though amongst the latter burning became common only in the later times of the republic. In this form of burial the corpse, after being borne in procession through the streets, was placed upon a pyre built of wood, and profusely sprinkled with oils and perfumes. Fire was set to the wood, and after the process of cremation was complete the bones and ashes were carefully gathered together by the relatives and placed in an urn. With the introduction of the Christian religion consecrated places were appropriated for the purpose of general burial, and the Roman custom of providing the sepulchre with a stone and inscription was continued by the Christians. The practice of cremation then declined and finally disappeared, but has recently to some little extent been revived.

**Buriats** (bö'ri-ats), a nomadic Tartar people allied to the Kalmucks, inhabiting the southern part of the government of Irkutsk and Transbaikalia. Their number is about 200,000. They live in huts called *yurts*, which in summer are covered with leather, in winter with felt. They support themselves by their flocks, by hunting, and the mechanical arts, particularly the forging of iron.

**Buridan** (bü-rē-dăn), JEAN, a French scholastic philosopher of the 14th century. He was a disciple of Occam at Paris, and has attained a kind of fame from an illustration he is said to have used in favor of his theory of determinism (that is, the doctrine that every act of volition is determined by some motive external to the will itself), and which still goes under the name of 'Buridan's ass.' He is said to have supposed the case of a hungry ass placed at an equal distance from two equally attractive bundles of hay, and to have asserted that in the supposed case the ass must inevitably have perished from hunger, there being nothing to determine him to prefer the one bundle to the other.

The nature of the illustration, however, makes it more likely that it was invented by Buridan's opponents to ridicule his views than by himself. Buridan died after 1358 at the age of sixty.

**Burin** (bū'rin), or GRAVER, an instrument of tempered steel, used for engraving on copper, steel, etc. It is of a prismatic form, having one end attached to a short wooden handle, and the other ground off obliquely, so as to produce a sharp triangular point. In working, the burin is held in the palm of the hand, and pushed forward so as to cut a portion of the metal.

**Buriti** (bụ-rē'tē), a South American palm (*Mauritia vinifĕra*) growing to the height of 100–150 feet, preferring marshy situations, and bearing an imposing crown of fan-shaped leaves. A sweet vinous liquor is prepared from the juice of the stem, as also from the fruits.

**Burke** (burk), EDMUND, a writer, orator, and statesman of great eminence, was born in Dublin, Jan. 1, 1730. After studying at Trinity College, Dublin, where he took a bachelor's degree, he went to London in 1750, and became a law student at the Temple. He applied himself more to literature

**Edmund Burke.**

than to law, and in 1756 published his *Essay on the Sublime and the Beautiful*, which attracted considerable attention, and procured him the friendship of some of the most notable men of the time. The political career for which he had been arduously preparing himself all along at length opened up to him on his appointment as private secretary to Mr. W. G. Hamilton, secretary for Ireland, in 1761. On his return he was rewarded with a pension of £300 per annum, and obtained the appointment of private secretary to the Marquis of Rockingham, then First Lord of the Treasury. Through the same interest he entered parliament as member for Wendover (1765). The great question of the right of taxing the American colonies was then occupying parliament, and the Rockingham ministry having taken, mainly through Burke's advice, a middle and undecided course, was soon dissolved (1766). From 1770 to 1782 Lord North was in power, and Burke held no office. In 1774–80 he was member for Bristol. In several magnificent speeches he criticised the ministerial measures with regard to the colonies, and advocated a policy of justice and conciliation. In 1782, when the Rockingham party returned to power, Burke obtained the lucrative post of paymaster-general of the forces, and shortly after introduced his famous bill for economical reform, which passed after considerable modifications had been made on it. On the fall of the Duke of Portland's coalition ministry, 1783, of which Burke had also been part, Pitt again succeeded to power, and it was during this administration that the impeachment of Hastings, in which Burke was the prime mover, took place. The lucidity, eloquence, and mastery of detail which Burke showed on this occasion have never been surpassed. The chief feature in the latter part of Burke's life was his resolute struggle against the ideas and doctrines of the French revolution. His attitude on this question separated him from his old friend Fox, and the Liberals who followed Fox. His famous *Reflections on the Revolution in France*, a pamphlet which appeared in 1790, had an unprecedented sale, and gave enormous impetus to the reaction which had commenced in England. From this most of his writings are powerful pleadings on the same side. We may mention *An Appeal from the New to the Old Whigs; Letter to a Noble Lord; Letters on a Regicide Peace;* etc. In 1794 he withdrew from parliament. Three years after, on July 8, 1797, he died, his end being hastened by grief for the loss of his only son.

**Burke,** ROBERT O'HARA, an Australian explorer, born in County Galway, Ireland, in 1821; died in Australia in 1861. After serving in the Austrian army he went to Australia, and after seven years' service as inspector of police was appointed commander of an expedition to cross the continent of Australia from south to north. He and his associate Wills reached the tidal waters

of the Flinders river, but both perished of starvation on the return journey.

**Burleigh** (bur'lē), LORD. See *Cecil.*

**Burlesque** (bur-lesk') signifies a low form of the comic, arising generally from a ludicrous mixture of things high and low. High thoughts, for instance, are clothed in low expressions, noble subjects described in a familiar manner, or *vice versa.* It is a take-off or mockery of something more serious.

**Burletta** (bur-let'a), a light, comic species of musical drama, which derives its name from the Italian *burlare,* to jest.

**Burlingame** (bur'lin-gam), ANSON, diplomat, was born in New York in 1820; died in 1870. He was an early worker in the free-soil party; a leader in the American party; and a member of congress, 1854–61. In 1861 he was sent as minister to China and here negotiated important treaties, securing China's recognition of international rights of property, trade, and worship. About the end of 1867 he was appointed by China ambassador to the United States and the great powers of Europe.

**Burlington** (bur'ling-tun), a city, county seat of Des Moines Co., Iowa, on the Mississippi River, 206 miles S. W. of Chicago. It is a railroad center and an important manufacturing point; its industries include iron and wood-working establishments, cigars, chemicals, baskets, etc. Here are the machine shops of the Chicago, Burlington and Quincy Railroad. The city has the commission form of government. Pop. 24,324.

**Burlington,** a city of New Jersey, on the Delaware River, 18 miles above Camden. It has several important industries, including iron foundries, shoe factories, silk mill, etc. It was first settled in 1667. Pop. 8336.

**Burlington,** a city of Vermont, county seat, Chittenden County, and a port of entry on the eastern shore of Lake Champlain, has a large inland commerce. It is the seat of the University of Vermont, founded in 1791. It is one of the leading lumber markets in the United States, and has varied manufacturing industries. Green Mount Cemetery holds the grave of Ethan Allan, the revolutionary hero, and Fort Ethan Allan, a cavalry post, is three miles distant. Pop. 20,468.

**Burmah** (bur'ma), a country of Southern Asia, bounded on the north by Assam and Thibet, on the east by Chinese territory and Siam, elsewhere mainly by the Bay of Bengal; area about 236,700 square miles. It is traversed by great mountain ranges branching off from those of Northern India and running parallel to each other southwards to the sea. Between these ranges and in the plains or valleys here situated the four great rivers of Burmah—the Irrawaddy, its tributary the Kyen-dwen, the Sittang, and the Salwen—flow in a southerly direction to the sea, watering the rich alluvial tracts of Lower Burmah, and having at their mouths all the great seaports of the country—Rangoon, Bassein, Moulmein, Akyab, etc. The Irrawaddy is of great value as a highway of communication and traffic, being navigable beyond Bhamo, near the Chinese frontier, or over 800 miles. In their lower courses the rivers often overflow their banks in the rainy season. Though its resources are almost entirely undeveloped, the country, as a whole, is productive, especially in the lower portions. Here grow rice, sugar-cane, tobacco, cotton, indigo, etc. Cotton is grown almost everywhere; tea is cultivated in many of the more elevated parts. The forests produce timber of many sorts, including teak, which grows most luxuriantly, and is largely exported. Iron-wood is another valuable timber; and among forest products are also the bamboo, cutch, stick-lac, and rubber. Burmah has great mineral wealth—gold, silver, precious stones, iron, marble, lead, tin, coal, petroleum, etc.; but these resources have not yet been much developed. The chief precious stone is the ruby, and the mines of this gem belong to the crown. Sapphire, amber, and jade are also obtained. Among wild animals are the elephant, rhinoceros, tiger, leopard, deer of various kinds, and the wild hog. Among domestic animals are the ox, buffalo, horse, and elephant. The rivers abound with fish. The most common fruits are the guava, custard-apple, tamarind, pine, orange, banana, jack, and mango. The yam and sweet potato are cultivated, and in some parts the common potato. The climate, of course, varies according to elevation and other circumstances, but as a whole is warm, though not unhealthy, except in low, jungly districts. The rainfall among the mountains reaches as high as 190 inches per annum.

The population by the last census taken was stated as 10,490,624, made up of a great variety of races besides the Burmese proper, as Talaings, Shans, Karens, etc. The Burmese proper are of a brown color, with lank, black hair (seldom any on the face), and have active, vigorous,

well-proportioned frames. They are a cheerful, lively people, fond of amusement, averse to continuous exertion, free from prejudice of caste or creed, temperate and hardy. The predominant religion is Buddhism. Missionaries are active in their efforts, but the Christian faith has not yet made much progress in the country. Polygamy is permitted by Buddhist law, but is rare, and is considered as not altogether respectable. Divorce is easily obtained. Women in Burmah occupy a much freer and happier position than they do in Indian social life. They go about freely, manage the household, and make successful women of business, conducting not merely retail trades but also large wholesale concerns. Education is very general, one of the chief occupations of the monks in the numerous monasteries being the teaching of boys to read and write. Many of these monastic schools are under government inspection. The Burmese are skillful weavers, smiths, sculptors, workers in gold and silver, joiners, etc. The ordinary buildings are of a very slight construction, chiefly of timber or bamboo raised on posts; but the religious edifices are in many cases imposing, though the material is but brick. Carving and gilding are features of their architecture. The Burmese language is monosyllabic, like Chinese, and is written with an alphabet the characters of which (derived from India) are more or less circular. There is a considerable literature.

Burmah is now divided into *Lower Burmah* and *Upper Burmah*, the former till 1886 being called British Burmah, while the latter tili that date was an independent kingdom or empire. Lower Burmah was acquired from independent Burmah in 1826 and 1852 as the result of two wars terminating in favor of Britain. It comprises the divisions of Aracan, Pegu, Irrawaddy, and Tenasserim; area, 87,473 sq. miles; pop. (1901) 5,389,897. Under British rule it has prospered greatly, the population and trade having increased immensely, and there being regularly a large surplus revenue. Roads, canals, and railways have been constructed and other public works carried out, as also public buildings erected. The chief city and port is Rangoon, which is now connected by railway with Mandalay in Upper Burmah.

Under its native kings the form of government in Upper Burmah was absolute monarchy, the seat of government being latterly at Mandalay. The king was assisted in governing by a council of state known as the *Hloot-daw*, to which belonged the functions of a house of legislature, a cabinet, and a supreme court. The king had power to punish at his pleasure anyone, even the great officers of state. The revenue was derived from taxes levied in a very irregular and capricious manner, and official corruption was rampant. The criminal laws were barbarously severe. Capital punishment was commonly inflicted by decapitation, but crucifixion and disemboweling were also practised. After the loss of the maritime provinces the influence of independent Burmah greatly declined, as did also its Asiatic and foreign trade.

The Burmese empire is of little note in ancient or general history. Since the 16th century the Burmese proper have mostly been the predominant race, and ruled the Peguans, Karens, etc., throughout the country. The capital has at different times been at Ava, Pegu, Prome, or elsewhere. In the latter half of the 18th century the Burmese emperors began a series of wars of conquest with China, Siam, Assam, through which they greatly enlarged the empire. This brought them into contact with the British, and in 1824 war was declared against them on account of their encroachments on British territory and their seizure of British subjects. The war terminated in the cession of the provinces of Aracan and Tenasserim to the British. Peace continued for some years, but at a later date various acts of hostility were committed by the Burmese, and in 1852 the maltreatment of British subjects occasioned a second war, at the end of which the British possessions were extended to include the whole of Pegu. The third and last war occurred in 1885 in consequence of the arrogance and arbitrary conduct of King Theebaw. The result was that Upper Burmah was annexed to the British empire by proclamation of the Viceroy of India, 1st Jan., 1886. The area thus annexed was about 200,000 sq. miles, of which half belonged to the kingdom proper, half to the semi-independent Shan states. The seat of government under the new administration is Rangoon.

**Burnaby** (bur'na-bi), FREDERICK GUSTAVUS, an English soldier and traveler, born in 1842, educated at Harrow, and entered the Royal Horse Guards in his eighteenth year. He subsequently became an extensive traveler, and in 1875 he made his famous ride to Khiva—a journey that presented great difficulties. In 1876 he rode through Asiatic Turkey and Persia. Of both these journeys he published narratives. In 1885 (Jan. 17), while serving as lieutenant-colonel of the Royal Horse Guards in the Egyp

tian campaign, he was slain at the battle of Abu-Klea.

**Burne-Jones,** SIR EDWARD, an English painter, born in 1833, at Birmingham, where and at Exeter College, Oxford, he was educated. He early adopted the profession of artist, and came under the influence of D. G. Rossetti. He painted in water-color as well as oil, and his works are remarkable for richness of coloring as well as for their poetical ideal. The *Mirror of Venus* sold for 5000 guineas. He was knighted in 1894 and died in 1898.

**Bur'nand,** SIR FRANCIS COWLEY, an English humorist, born in 1837; was educated at Eton and Cambridge and admitted to the bar in 1862. He became chief editor of *Punch* in 1874, and published novels, burlesque plays, etc. Among his works of burlesque are *Happy Thoughts, Happy Thought Hall,* etc.

**Burnes** (bêrnz), SIR ALEXANDER, was born at Montrose, Scotland, in 1805, studied at the academy there, and having obtained a cadetship in the Indian army, arrived at Bombay in 1821. His promotion was rapid, and in 1832 he was sent on a mission to Central Asia, and visited Afghanistan, Bokhara, Merv, etc., returning by way of Persia. He was then sent to England, and published his travels, which were read with a degree of enthusiasm. In 1839 he was appointed political agent at Cabul. Here, in 1841, he was murdered on the breaking out of an insurrection.

**Burnet** (bur'net), the popular name of two genera of plants, natural order Rosaceæ.—1. COMMON or LESSER BURNET (*Potcrium sanguisorba*), a perennial plant of Europe and N. America which grows to the height of about 2 feet, with smooth, alternate, imparipinnate leaves, and flowers arranged in rounded heads of a purplish color.—2. GREATER BURNET (*Sanguisorba officinălis*), also a perennial plant with imparipinnate leaves; flowers red, arranged on oval spikes at the extremity of long pedicles. Both kinds make very wholesome food for cattle. *S Canadensis* is a Canadian species.

**Burnet,** GILBERT, a celebrated prelate and historian, born at Edinburgh in 1643. Having studied at Aberdeen, he traveled into Holland in 1664. He was ordained in 1665, was for some years minister of Saltoun parish, and became professor of divinity at Glasgow in 1669. Here he resided more than four years and wrote several works, one of them his *Vindication of the Church and State of Scotland.* In 1675 he became chaplain to the Rolls Chapel, London. He was long in great favor at court, but the court favor did not continue, for Burnet, dreading the machinations of the Catholic party, joined the opposition, and wrote his *History of the Reformation in England,* the first volume of which appeared in 1679 (the other two in 1681 and 1714, respectively). His connection with the opposition party afterwards became very intimate, and he published several works in favor of liberty and Protestantism. Eventually he was invited to The Hague by the Prince and Princess of Orange, and had a great share in the councils relative to Britain. He accompanied the Prince of Orange to England as chaplain, and was rewarded for his services with the bishopric of Salisbury. As a prelate Bishop Burnet distinguished himself by fervor, assiduity, and charity. He died in March 1715, leaving behind him his well-known *History of his Own Times* (two vols. fol., 1723–24).

**Bur'nett** (bur'net), FRANCES ELIZA (HODGSON), novelist, born in Manchester, England, in 1849. At the close of the Civil war she came to the United States, and in 1873 married Dr. S. M. Burnett; resided at Washington some time, afterwards in London. She was divorced from her husband in 1899 and the following year married Stephen Townsend, an English lawyer. She became well known as a novelist by *That Lass of Lowrie's,* while her *Little Lord Fauntleroy* became an immense favorite. Other works were *Haworth's, Louisiana, Through One Administration, A Lady of Quality; His Grace, the Duke of Ormonde,* etc.

**Bur'nett,** JAMES. See *Monboddo, Lord.*

**Burnett Prizes,** prizes established by a Mr. Burnett, merchant, of Aberdeen, on his death in 1784. He left a fund from which were to be given every forty years two theological prizes (not less than £1200 and £400) for the best two essays in favor of the evidence that there is an all-powerful, wise, and good Being, and this independent of all revelation. The first competition was in 1815, when Dr. Brown, principal of Aberdeen University, gained the first prize, and Dr. John Bird Sumner, afterwards Archbishop of Canterbury, the second. In 1855 the first prize was adjudged to the Rev. R. A. Thompson, Lincolnshire, and the second prize to the Rev. Dr. John Tulloch, afterwards principal of St. Mary's College, St. Andrews. The destination of the fund was

afterwards altered by parliament, and courses of lectures are now delivered, the first, on Light, being by Prof. Gabriel Stokes in 1883.

**Burnett's Disinfecting Liquid,** an antiseptic liquid and deodorizer prepared from chloride of zinc. It is useful in deodorizing sewage, bilge-water in ships, etc., and is found of service in the dissecting-room.

**Burney** (bur'ni), CHARLES, an English composer and writer on music, born in 1726; died in 1814. He studied under Dr. Arne, and soon obtained a reputation for his musical pieces. While organist at Lynn Regis he commenced his *General History of Music*. He wrote also several other valuable works.

**Burney,** FRANCES, daughter of the preceding, also known as Madame D'Arblay, an eminent novelist, born in 1752; died in 1840. Her first novel, *Evelina*, appeared in 1778 and attracted remarkable attention, able critics pronouncing the author superior to Fielding. Her second book, *Cecilia*, added to her reputation, it being placed among the classic novels of Europe. In 1786 she became second keeper of the robes to Queen Charlotte, and for five years lived an unhappy life. In 1792 she married Count D'Arblay, an estimable French exile. She afterwards wrote other novels and published her *Diary and Letters*, a work of much interest. It is a little difficult in our day to understand the extravagant eulogies of her novels by her contemporaries.

**Burnham** (burn'am), SHERBURNE WESLEY, astronomer born at Thetford, Vermont, in 1838. He became connected with the Lick and Chicago observatories and was appointed professor of practical astronomy at the University of Chicago. He is notable for his discovery of double stars, of which he has catalogued more than 1200.

**Burning-glass,** a lens which, by bringing the sun's rays rapidly to a focus, produces a heat strong enough to kindle combustible matter. The lenses commonly used are convex on both sides, and have a small focal distance. That such a glass may produce its greatest effect it is necessary that the rays of the sun should fall upon it in a perpendicular direction. The effect may be greatly augmented by the use of a second lens, of a smaller focal distance, placed between the first and its focus. Some immense burning-glasses have been made, producing surprising effects. Concave *burning-mirrors* produce the same kind of results, and have almost four times more power than burning-glasses of equal extent and curvature. The concavity must present a surface of high reflecting power (polished silver or other metal, or silvered glass), and must be either spherical or parabolic. Plane mirrors may also be employed like concave ones, if several of them are combined in a proper manner. The ancients were acquainted with such mirrors, and Archimedes is said to have set the Roman fleet on fire at the siege of Syracuse (B. C. 212) by some such means. In 1747 Buffon by a combination of mirrors burned wood at the distance of 200 feet and melted tin at the distance of 150 feet, with other interesting experiments.

**Burnisher** (bur'nish-er), a blunt, smooth tool, used for smoothing a rough surface by rubbing. Agates, tempered steel, and dogs' teeth are used for burnishing.

**Burnley** (burn'li), a parliamentary and municipal borough of England, in Lancashire, about 22 miles N. of Manchester. The town presents a modern appearance, and is, generally speaking, well built, mainly of stone. The staple manufacture is cotton goods, there being large cotton-mills, also several extensive foundries and machine-shops, with collieries and other works, in the vicinity. Pop. (1911) 106,337.

**Burnoose** (bèr-nös'), a large kind of mantle in use among the Bedouin Arabs and the Berbers of Northern Africa, commonly made of white wool, but sometimes also of red, blue, green, or some other color, and having a hood which may be drawn over the head in case of rain.

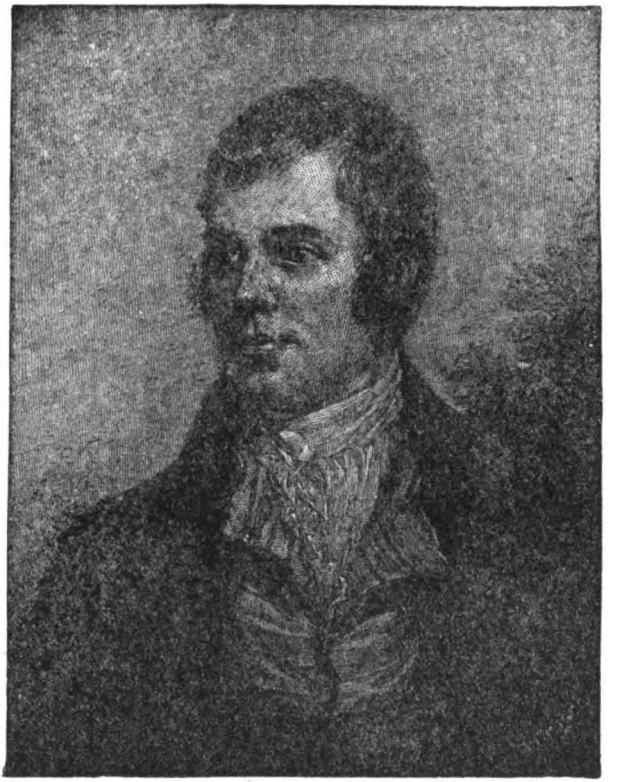
**Burnouf** (bûr-nöf'), EUGÈNE, a French scholar, born at Paris in 1801; died in 1852. He devoted himself to the study of oriental languages, particularly those of Persia and India. In 1826 he attracted the attention of men of learning throughout Europe by publishing in conjunction with his friend Chr. Lassen, an *Essay on the Pali*, or the sacred language of the Buddhists in Ceylon and the Eastern Peninsula. But his fame is chiefly due to his having, so to speak, restored to life an entire language, the Zend or old Persian language in which the Zoroastrian writings were composed. Burnouf also distinguished himself by his labors on Buddhism, publishing *Introduction à l'Histoire du Bouddhisme Indien*.

**Burns,** JOHN, an English labor leader, born at Vauxhall in 1858. He worked as rivet-boy and engineer, early became a Socialist, and at-

tracted attention in his speeches on this topic Becoming active as a labor leader, he greatly aided the dock laborers in winning in their 1889 strike. He was thrice elected to the London County Council, was elected to Parliament in 1892 and 1895, and in 1905 became a member of the Liberal ministry, as president of the local government board.

**Burns,** Robert, the great lyric poet of Scotland, was born near Ayr, January 25, 1759, his father being a gardener, and latterly a small farmer. He was instructed in the ordinary branches of an English education by a teacher engaged by his father and a few neighbors; to these he afterwards added French and a little mathematics. But most of his education was got from the general reading of books, to which he gave himself with passion. In this manner he learned what the best English poets might teach him, and cultivated the instinct for poetry which had been implanted in his nature. At an early age he had to assist in the labors of the farm, and when only fifteen years old had to do almost the work of a man. In 1781 he went to learn the business of flax-dresser at Irvine, but the premises were destroyed by fire, and he was thus led to give up the scheme. His father dying in 1784, he took a small farm (Mossgiel) in conjunction with his younger brother Gilbert. He now began to produce poetical pieces which attracted the notice of his neighbors and gained him considerable local reputation. His first lines had been written some time previously, having been inspired by love, a passion to which he was peculiarly susceptible. While at Mossgiel he formed a connection with Jean Armour, a Mauchline girl, which resulted in the prospect of her soon becoming a mother. Burns was willing to marry her, but her father, a respectable master mason, would not permit it, deeming Burns, on account of his poor circumstances, and perhaps for other reasons, no suitable match. This affair rendered the poet's position so uncomfortable, and so wounded his pride, that he determined to emigrate to Jamaica, and engaged himself as assistant overseer on a plantation there. To obtain the funds necessary for the voyage he was induced to publish, by subscription, a volume of his poetical effusions. It was printed at Kilmarnock in 1786, and Burns, having thus obtained the assistance he expected, was about to sail from his native land, when he was drawn to Edinburgh by a letter from Dr. Blacklock to an Ayrshire friend of his and the poet, recommending that he should take advantage of the general admiration his poems had excited, and publish a new edition of them. This advice was eagerly adopted, and the result exceeded his most sanguine expectations. After remaining more than a year in the Scottish metropolis, admired, flattered, and caressed by persons of eminence for their rank, fortune, or talents, he retired to the country with the sum of some $2500, which he had realized by the second publication of his poems. A part of this sum he advanced to his brother, and with the remainder took a considerable farm (Ellisland) near Dumfries, to which he subsequently added the office of exciseman. He now married, or rather formally completed his marriage with, Jean Armour. But the farming at Ellisland was not a success, and in about three years Burns removed to Dumfries and relied on his employment as an exciseman alone. He continued to exercise his pen, particularly in the composition of a number of beautiful songs adapted to old Scottish tunes. But his residence in Dumfries, and the society of the idle and the dissipated who gathered round him there, attracted by the brilliant wit that gave its charm to their conviviality, had an evil effect on Burns, whom disappointment and misfortunes were now making somewhat reckless. In the winter of 1795 his constitution, broken by cares, irregularities, and passions, fell into premature decline; and in July, 1796, a rheumatic fever terminated his life and sufferings at the early age of thirty-seven. He left a wife and four children, for whose support his friends and admirers raised a subscription, and with the same object an edition of his works, in four vols. 8vo, was published in 1800 by Dr. Currie, of Liverpool. His character, though marred by imprudence, was never contaminated by duplicity or meanness. He was an honest, proud, warm-hearted man, combining sound understanding with high passions and a vigorous and excursive imagination. He was alive to every species of emotion; and he is one of the few poets who have at once excelled in humor, in tenderness, and in sublimity.

**Burns and Scalds** are injuries produced by the application of excessive heat to the human body. They are generally dangerous in proportion to the extent of surface they cover, and a widespread scald may cause serious consequences on account of the nervous shock. Congestion of the brain, pneumonia, inflammation of the bowels, or lockjaw may result from an extensive burn. Hence the treatment requires to



ROBERT BURNS

be both local and constitutional. If there is shivering or exhaustion stimulants may be resorted to, or if the pain is intense, sedatives given. The local treatment will consist in carrying out the instructions of the physician, who should be summoned at once in cases of bad burns. Many remedies of home treatment have been recommended; but these should be applied with caution, that the condition of the sufferer may not be aggravated rather than relieved. The utmost care should be exercised in removing the clothing from the patient, and the injured parts should be handled with gentleness. Sometimes, if the burn be not too extensive, applications of cold water to the part will afford relief. Burns differ from scalds in being caused by dry heat, while scalds are caused by moist heat.

**Burnside** (burn'sīd), AMBROSE EVERETT, an American soldier, born at Liberty, Indiana, in 1824; died Sept. 13, 1881. He was graduated at the West Point Military Academy in 1847 and served in the army until 1853, when he retired to private life. On the outbreak of the Civil war he became a colonel of volunteers, commanding a brigade at Bull Run, and in 1862 commanded the expedition which captured Roanoke Island and Newbern. Promoted successively brigadier- and major-general, he took part in the battles of South Mountain and Antietam with distinction, and when, on Nov. 7, 1862, General McClellan was relieved from his command, Burnside succeeded him as commander of the Army of the Potomac. In the following December he crossed the Rappahannock and attacked Lee in his entrenchments at Fredericksburg, but was repulsed with frightful loss. Removed from his command at his own request, he repulsed Longstreet at Knoxville, in Sept., 1863. He commanded the ninth corps in Grant's advance on Richmond in 1864. After the war he was for three terms elected Governor of Rhode Island and was elected to the United States Senate in 1875 and 1881.

**Burnt Offering,** something offered and burnt on an altar as an atonement for sin; a sacrifice. The burnt offerings of the Jews were either some clean animal, as an ox, a sheep, a pigeon; or some species of vegetable substance, as bread, flour, ears of wheat or barley.

**Burnt Sienna,** an ocherous earth known as sienna earth (*Terra di Sienna*) submitted to the action of fire, by which it is converted into a fine orange-brown pigment, used both in oil and water-color painting.

**Burnt Umber,** a pigment of reddish-brown color obtained by burning umber, a soft, earthy mixture of the peroxides of iron and manganese, deriving its name from Umbria in Italy.

**Buro.** See *Booro.*

**Burr,** AARON, third vice-president of the United States, was born in New Jersey in 1756. After serving with honor in the Revolutionary army he became a lawyer, and an adroit orator. He finally became a leader of the Democratic party and was elected vice-president under Jefferson in 1800. In fact, Jefferson and Burr secured equal numbers of electoral votes, and only an exciting contest in Congress settled their respective positions as president and vice-president. In 1804 he sought to become governor of New York, but was defeated, partly through the agency of Alexander Hamilton. He challenged Hamilton, and killed him in a duel in July, 1804. This act ended Burr's political career. The storm of popular indignation was so great that he found it expedient to leave New York and go west. Here he conceived an audacious scheme of founding an empire at the expense of Mexico in the southwest. His purpose being suspected, he was arrested and tried for treason, and though acquitted, sank into obscurity. He died Sept. 14, 1836.

**Burrard Inlet** (bur'ard), an inlet of British Columbia, forming a fine harbor, and having Vancouver, the terminus of the Canadian Pacific Railway, on its northern shore.

**Burrillville** (bur'il-vil), a township (town) of Providence Co., Rhode Island, about 22 miles N. W. of Providence, has manufactures of cotton and woolen goods, etc. Pop. 7878.

**Bur'ritt** (bur'it), ELIHU, the 'learned blacksmith,' was born at New Britain, Conn., Dec. 8, 1810. He was apprenticed to a blacksmith, but began to read English literature, and acquired proficiency in the ancient and most modern languages of Europe. He afterwards came into public notice as a lecturer on behalf of temperance, the abolition of slavery and war, etc., and published papers, and founded organizations to further these ends. In 1848 the first International Peace Congress was held under his guidance at Brussels. In 1865 he was consular agent at Birmingham. In 1868 he returned to live on his farm in America, and died March 7, 1879. His best-known writings are *Sparks from the Anvil; Thoughts and Things at Home and Abroad; Chips from Many Blocks;* etc.

**Burroughs** (bur'roz), JOHN, naturalist and author, born at Roxbury, New York, in 1837. He became a journalist in New York city and in 1863 received an appointment in the United States Treasury Department. In later years he settled on a farm in New York, dividing his time between fruit culture, literary work, and services as a bank examiner. He wrote much for periodicals and such works as *Wake Robin*, *Winter Sunshine*, *Birds and Poets*, *Locusts and Wild Honey*, *Essays on Trees*, *Birds and Flowers*, etc. His works are vivacious and idiomatic in style and have been very popular.

**Burrowing Owl**, an American owl, the *Athēna cunicularia*, which dwells in holes in the ground made either by itself or by some other animal, as the prairie-dog or marmot. It feeds on insects and seeks its food by day.

**Burr'stone.** See *Buhrstone.*

**Bursary** (bur'sa-ri), an endowment in one of the Scotch universities, corresponding to an exhibition in an English university, and intended for the support of a student during his ordinary course, and before he has taken a degree in the faculty in which he holds the bursary. This circumstance, according to the usage prevailing in Scotland, distinguishes bursaries from scholarships and fellowships, both of which are bestowed after the student has taken a degree. Each of the four universities of Scotland has a greater or smaller number of bursaries. Of late years most bursaries are awarded after competitive examination, and only a few are now given by the patrons for special reasons.

**Burscheid** (bur'shīd), a manufacturing town of Prussia, some 20 miles from Düsseldorf. Pop. 6259.

**Burslem** (burs'lem), a town of England, in Staffordshire, within the parliamentary borough of Stoke-upon-Trent, and in the center of 'The Potteries.' Here is the Wedgwood Memorial Institute, comprising a free library, a museum, and a school of art, erected in honor of Josiah Wedgwood, who was born at Burslem in 1730. Burslem has extensive manufactures of china and earthenware, in which trade and coal-mining the inhabitants are chiefly employed. Pop. (1911) 44,153.

**Burton** (bur'ton), JOHN HILL, historian of Scotland, born at Aberdeen in 1809; died near Edinburgh, in 1881. He graduated at Marischal College, Aberdeen, adopted the law as a profession, and became an advocate in Edinburgh, but literature was really the business of his life. He early contributed to the *Edinburgh and North British*, to *Blackwood's Magazine*, and to the *Scotsman*. His first book was the *Life and Correspondence of David Hume* (1846), followed by *Lives of Lord Lovat and Duncan Forbes of Culloden*, and other works. His chief work was his *History of Scotland from the Earliest Times to* 1746 (2d edition, 8 vols. 1837); others equally well known were *The Scot Abroad*, and the *Book-hunter*. He was appointed secretary to the Scottish Prison Board in 1854, and was connected with this department till his death.

**Burton,** SIR RICHARD FRANCIS, an English traveler and linguist; born in 1821; died in 1890. He joined the Indian army in 1842, and showed a remarkable facility in acquiring the languages and manners of the natives. In 1853 he went to Arabia, and visited Mecca and Medina disguised as a Mohammedan pilgrim—a very perilous enterprise. After serving in the Crimean war he made a journey to East Africa along with Captain Speke, which led to the discovery of the great lake Tanganyika. He served as British consul at Fernando Po, at Santos in Brazil, and from 1872 at Trieste. He visited numerous countries and published many works, amongst which are *Sindh and the Races that Inhabit India; Personal Narrative of a Pilgrimage to El Medinah and Mecca; The Lake Regions of Central Africa; The City of the Saints and Across the Rocky Mountains to California; The Nile Basin; The Highlands of Brazil; Ultima Thule, or a Summer in Iceland; The Gold Mines of Midian; The Book of the Sword;* translations of Camoens's *Lusiad* and of the *Arabian Nights*, etc.

**Bur'ton,** ROBERT, an English writer, born at Lindley in Leicestershire in 1576. He studied at Christ Church, Oxford, where he seems to have lived all his life. His vast out-of-the-way learning is curiously displayed in his book *The Anatomy of Melancholy*, which he published in 1621. Burton died in 1640.

**Burton,** WILLIAM E., a celebrated comedian, born in London, in 1804; died in New York, in 1860. He resided in the United States after 1834 and was manager of several theaters in New York and Philadelphia. He edited *Cyclopedia of Wit and Humor.*

**Burton-on-Trent,** a municipal borough of England, in Staffordshire, on the N. bank of the Trent, in a low, level situation. Malting and iron-founding are carried on to a con-

siderable extent, but it is chiefly celebrated for its excellent ale, for which there are numerous breweries, employing upwards of 5000 men and boys. Pop. (1911) 48,275.

**Burtscheid** (burt'shīt), a town in Rhenish Prussia, forming a suburb of Aix-la-Chapelle, with extensive manufactures, particularly of woolens, and celebrated thermal springs. Pop. 15,871.

**Buru.** See *Booro.*

**Burujird.** See *Booroojird.*

**Bury** (be'ri), a municipal and parliamentary borough of England, in Lancashire, 8 miles N. N. W. of Manchester, well situated on a rising ground between the Irwell and the Roche. The staple manufacture is that of cotton, and there are also large woolen factories, bleaching and printing works, dye-works, foundries, etc. There are extensive coal mines in the vicinity. Pop. (1911) 58,649.

**Burying Beetle** (*Necrophŏrus*), the name of a genus of insects belonging to the order Coleoptera, or beetles, and the tribe of the Silphidæ, or carrion beetles.

**Bury St. Edmund's,** or ST. EDMUNDSBURY, a parliamentary and municipal borough in Suffolk, England, well built and delightfully situated on the Larke, 26 miles from Ipswich. Agricultural implements are manufactured, and there is a large trade in agricultural produce. It is an ancient place, and derived its name from St. Edmund, a king of the East Angles, slain by the heathen Danes and buried here. It contains the remains of an abbey, once the most wealthy and magnificent in Britain. Pop. 16,785.

**Busaco** (bö-sa'kō), a mountain ridge in the province of Beira, Portugal. It was here that Wellington repulsed Massena (27th September, 1810) and continued his retreat to the lines of Torres Vedras.

**Busby** (buz'bi), a military headdress worn by hussars, artillerymen, and engineers, consisting of a fur hat with a bag, of the same color as the facings of the regiment, hanging from the top over the right side. The bag appears to be a relic of a Hungarian headdress from which a long padded bag hung over, and was attached to the right shoulder as a defense against sword-cuts.

**Bush'buck,** a name given to several African species of antelopes, especially to *Tragelăphus sylvatica*, 4 feet long and 2½ feet high, with triangular subspiral horns. The male is dark sepia brown and the female reddish brown above; both are white below. The *white-backed bushbuck* is the *Cephalŏphus sylvicultrix*, a white-backed antelope of Sierra Leone, with black, shining, pointed, and nearly straight horns.

**Bushel** (bush'el), a dry measure, containing 8 gallons or 4 pecks. The British imperial bushel introduced in 1826 has a capacity of 2218.192 cubic inches, and holds 80 lbs. avoirdupois of distilled water at the temperature of 62° Fahr. with the barometer at 30 inches. The standard United States bushel is similar, containing 77.627 lbs. of water, or 2150.42 cubic inches.

**Bushire** (bö'shēr; properly, *Abu Shehr*, the father of cities), the principal seaport of Persia, on the Persian Gulf, 118½ miles W. S. W. Shiraz. It lies on the edge of a desert, and carries on a considerable traffic with India and Britain, importing rice, indigo, sugar, cotton goods, etc., and exporting shawls, dates, tobacco, carpets, wool drugs, etc. Pop. estimated at 15,000.

**Bushmen** (bush'men), or BOSJESMANS, a race of people who dwell in the western part of South Africa, in the immense plains bordering on the N. side of the colony of the Cape of Good Hope. They are the most degraded of the races who inhabit this country, uniting only for defence or pillage. They have no huts, and do not cultivate the land, but live by hunting. Their language is exceedingly crude, consisting only of a certain clicking with the tongue and gurgling sound, for which we have no letters.

**Bushnell,** HORACE, an American theologian, born at Litchfield, Conn., in 1802; died in 1876. He studied at Yale and was pastor of the North Congregational Church, Hartford, 1833-59. His book, *God in Christ* (1849), involved him in a charge of heresy, which, however, was not sustained. His works appeared in eight volumes, 1876-7.

**Bush-pig.** See *Bosch-vark.*

**Bushrangers** (bush-ranj-ers), the name for desperadoes in Australia who, taking to the bush, supported themselves by levying contributions on the property of all and sundry within their reach. Considerable gangs of these lawless characters sometimes collected. a body of fifty holding part of New South Wales in terror about 1830.

**Bush-shrikes,** American birds of the shrike family, forming the group Thamnophilinæ.

**Busiris** (bu-sī-ris), a town of ancient Egypt, in the Delta, the chief place where the rites of Isis were

celebrated. The name is also given as that of a mythical Egyptian king.

**Bus'kin,** a kind of high shoe worn upon the stage by the ancient actors of tragedy, in order to give them a more heroic appearance: often used figuratively for tragedy, like 'sock' for comedy.

**Buss,** a small vessel from 50 to 70 tons burden, carrying two masts, and with two sheds or cabins, one at each end, used in herring-fishing.

**Bussa,** BUSSANG. See *Boussa.*

**Bussorah** (bus'ō-ra), See *Bassora.*

**Bussu-palm,** the *Manicaria saccifĕra,* found in the swamps of the Amazon, whose stem is only 10 to 15 feet high, but whose leaves are often 30 feet long by 4 to 5 feet in breadth. These are used by the Indians for thatch, the spathes are used as bags, or when cut longitudinally and stretched out they form a coarse but strong kind of cloth.

**Bust** (Fr. *buste,* It. *busto*), in sculpture, the representation of that portion of the human figure which comprises the head and the upper part of the body. During the literary period of Greece the portrait busts of the learned formed an important branch of art, and in this way we came to possess faithful likenesses of Socrates, Plato, Demosthenes, etc., in which the artist showed great power of expressing the character of those represented. The number of busts belonging to the time of the Roman Empire is very considerable, but those of the Roman poets and men of letters have not been preserved in nearly so large numbers as those of the Greeks. The first bust that can be depended upon as giving a correct likeness is that of Scipio Africanus the elder.

**Bustard** (bus'tard), a bird belonging to the order Cursores, or runners, but approaching the waders. The great bustard (*Otis tardo*) is the largest

Great Bustard (*Otis tarda*).

European bird, the male often weighing 30 lbs., with a breadth of wing of 6 or 7 feet. The bustard is now rare in Britain, but abounds in the south and east of Europe and the steppes of Tartary, feeding on green corn and other vegetables, and on earthworms. Its flesh is esteemed. All the species run fast, and take flight with difficulty. The little bustard (*O. tetrax*) occasionally visits Britain. *O. nigriceps* is an Asiatic and *O. cærulescens* an African species. The Australian species (*O. Australiānus*) is a magnificent bird highly prized as food.

**Busto-Arsizio** (bŏs'tō-är-ed'zē-ō), a town of N. Italy, 20 miles N. W. of Milan. It has large cotton factories. Pop. 17,304.

**Butcher-bird.** See *Shrike.*

**Butcher's Broom** (bu'chers brōm; *Ruscus*), a genus of plants belonging to the natural order Liliaceæ. The flowers are diœcious and of a green color, and rise from branchlets dilated in the form of leaves. It is a shrubby evergreen plant, with angular stems. There are several species: *Ruscus aculeātus,* or the common butcher's broom, takes its name from being used by butchers to sweep their blocks.

**Bute** (būt), an island of Scotland in the estuary of the Clyde, with an area of about 50 sq. miles, belonging principally to the Marquis of Bute. It is about 15 miles long, and the average breadth is 3½ miles. Agriculture is in an advanced state, and there are about 20,000 acres under cultivation. The herring fishery is also a source of considerable profit. The only town is Rothesay, whose ancient castle is one of the interesting antiquities of the island. Pop. 12,162. The *county* of Bute comprises the islands of Bute, Arran, Great Cumbrae, Little Cumbrae, Inchmarnock, and Pladda.

**Bute,** JOHN STUART, EARL OF, a British statesman, born in 1713 in Scotland. He acquired great influence over Frederick, Prince of Wales, and was appointed chamberlain to his son, afterwards George III, through whose favor he became secretary of state, and ultimately, in 1762, prime-minister. For a time Pitt and Newcastle alike had to give way to his influence, but though possessing the full confidence of the king he was unpopular with the people, and in 1763 he suddenly resigned his office, and retired from public affairs to spend his leisure in literary and scientific pursuits, particularly in botany. He died in 1792.

**Butea** (bū'te-a), a genus of plants, nat. order Leguminosæ, tribe Papilionaceæ, natives of the East Indies. They are trees having pinnately trifoliate

leaves, with racemes of deep-scarlet flowers.

**Butler** (but'lẽr), county seat of Butler Co., Pennsylvania, 30 miles N. of Pittsburgh. Natural gas, coal and iron are found near by, and it has manufactures of woolens, silks, plate glass, steel cars, etc. Pop. 20,728.

**Butler,** ALBAN, an English writer, born in 1710; died in 1773. He was educated at the English (R. C.) College of Douay, where he became professor first of philosophy and then of divinity; latterly he was president of the English college of St. Omer. His *Lives of the Saints* is a monument of erudition which cost him thirty years' labor.

**Butler,** BENJAMIN FRANKLIN, general, and politician, born at Deerfield, New Hampshire, in 1818; died in 1893. He became noted as a criminal lawyer; in 1853 commenced to take a prominent part in politics on the Democratic side; in 1861, on the outbreak of the war, held the commission of brigadier-general of militia, and took service with his brigade on the Union side. He was the first to occupy Baltimore and Fortress Monroe, applying to the slaves that came into his camp the notable phrase of 'contraband of war.' After the opening of the lower Mississippi by Farragut he took command in New Orleans, and attracted much attention by his vigorous and effective rule. After the war he served in Congress from 1866 to 1878, and in 1882 was elected governor of Massachusetts.

**Butler,** JAMES, Duke of Ormonde, an eminent statesman in the reigns of Charles I and II. He was born at London in 1610, was a steady adherent of the royal cause, on the ruin of which he retired to France. At the Restoration he returned with the king, was created a duke, and appointed lord high steward of Ireland. After losing his office and the royal favor for some years, principally through the intrigues of Buckingham, he was again appointed lord-lieutenant of Ireland, and retained the post till the death of Charles, when he resigned, his principles not suiting the policy of James. He died in 1688.

**Butler,** JOSEPH, an English prelate and celebrated writer on ethics and theology, born in Berkshire in 1692. He was brought up a dissenter, but after examining the points of controversy between the Established Church and the dissenters, he decided to become a member of the former, and accordingly removed to Oxford in 1714, where he took orders. The sermons which he delivered as preacher at the Rolls Chapel, an appointment he occupied in 1817–26, still hold a high place in ethical literature. His great work is the *Analogy of Religion, Natural and Revealed, to the Constitution and Course of Nature*, which was published in 1736, and acquired for him a great reputation. In 1738 he was made Bishop of Bristol, and in 1750 promoted to the see of Durham. He died in 1752.

**Butler,** NICHOLAS MURRAY, an American educator, born at Elizabeth, New Jersey, April 2, 1862; graduated at Columbia in 1882 and took a Ph.D. degree there in 1884; also studied in Paris and Berlin. He became assistant in philosophy at Columbia in 1885, full professor in 1890. He became president of the New York College for the training of teachers (afterwards Teachers' College of Columbia University), and in 1901 succeeded Seth Low as president of Columbia. He has edited several educational series; founded the Educational Review; and has published *The Meaning of Education, True and False Democracy, Why Should We Change Our Form of Government? Education in the United States, The American as He Is, Philosophy*, etc.

**Butler,** SAMUEL, an English satirical poet, was the son of a farmer in Worcestershire, where he was born in 1612. He was educated at Worcester free-school, and held various situations as clerk or amanuensis to persons of position, among them being Sir Samuel Luke, a Puritan colonel of Bedfordshire, who is caricatured in the celebrated knight Hudibras. Butler published the first part of *Hudibras* after the Restoration, in 1663. It became immensely popular, and Charles II himself was perpetually quoting the poem, but did nothing for the author, who seems to have passed the latter part of his life dependent on the support of friends, and died in poverty in London in 1680. A second part of *Hudibras* appeared in 1664, a third in 1678. The poem is a sort of burlesque epic ridiculing Puritanism, and fanaticism and hypocrisy generally.

**Butler,** WILLIAM ORLANDO, an American soldier, born in Jessamine Co., Kentucky, in 1791; died in 1880. Served in the war of 1812; practiced law in Carrollton, 1817–39; was elected to Congress, 1839–43; and fought in the Mexican War, succeeding General Scott as commander of the U. S. Army in Mexico.

**Butte City,** the metropolis of Montana, in Silver Bow Co., one of the richest mining centers of the country, producing 18 per cent. of the world's copper. A state school of mines is located here, and one of the largest copper mining companies in existence. Elevation, 5490 feet. Pop. 65,000.

**Butter** (but'ẽr), a fatty substance produced from milk, especially cows' milk. When the milk is first drawn

this fatty matter is disseminated through it in minute clear globules, which in a short time rise to the surface and form cream. This cream is then separated from the milk, put through a process of churning, and the product worked to remove the water remaining in the churned mass. In obtaining the cream from the milk three methods are in more or less general use: Shallow setting, which consists of placing the milk in wide pans about four inches high; deep setting, employing pans about 18 inches deep; and the separator method, which is that most in use among the larger producers. In the shallow pan system there is a loss in skimming of from 0.5 to 1.5 per cent. of fat left in the skim milk. In the deep-setting the loss is less, often as little as 0.2 per cent. The separator, a mechanical device employing the principle of centrifugal force as a separating means, has reduced the loss of fat in the skim milk to a minimum, from 0.05 to 0.1 per cent. The centrifugal force of the separator is a thousand-fold greater than the force of gravity. The system of separation is continuous, a uniform flow of milk being conducted in a bowl or drum making from 5000 to 9000 revolutions a minute. Various sized machines are on the market, those worked by hand separating from 200 to 500 pounds of milk per hour, and power machines of 2000 pounds and over capacity.

The cream is churned sweet, or else "ripened" or soured, the object in the latter case being to develop certain flavors in the butter and also to aid in the process of churning. Ripening is due to the action of certain bacteria either present in the atmosphere or artificially introduced. Churning results in the rupture of the fat globules and their union in a mass separate from the buttermilk which is drawn off when the churning is completed; the butter is then washed, worked to remove buttermilk and water, salted and packed. The composition of butter varies, but is approximately: Fat, 85 per cent.; protein, 1 per cent.; ash (salt), 3 per cent.; water, 11 per cent. The food standard, given out by the U. S. Department of Agriculture requires not less than 82.5 per cent. of butter fat in butter. The quality depends upon the feed given the cows, their stage of lactation, the care of the milk, etc.

**But'terbur** (*Petasites vulgāris*), a composite plant, with large rhubarb-like leaves and purplish flowers, growing by the side of streams; allied to colt's-foot.

**Buttercup** (but'ĕr-cup), the popular name of two or three species of the Ranunculus, namely, *R. acris*, *R. bulbōsus*, and *R. repens*. They are common plants with brilliant yellow flowers.

**Butterfly** (but'ĕr-fli), the common name of all diurnal lepidopterous insects, corresponding to the original Linnæan genus *Papilio*. The family of the butterflies or diurnal Lepidoptera (so called to distinguish them from nocturnal or crepuscular Lepidoptera, such as moths) is a very extensive one, and naturalists differ much as to the manner of subdividing it. One of the most remarkable and interesting circumstances connected with these beautiful insects is their series of transformations before reaching a perfect state. The female butterfly lays a great quantity of eggs, which produce larvæ, commonly called caterpillars. After a short life these assume a new form, and become chrysalids or pupæ. These chrysalids are attached to other bodies in various ways, and are of various forms; they often have brilliant golden or argentine spots. Within its covering the insect develops, to emerge as the active and brilliant butterfly. These insects in their perfect form suck the nectar of plants, but take little food, and are all believed to be short-lived, their work in the perfect state being almost confined to the propagation of the species. Butterflies vary greatly in size and coloring, but most of them are very beautiful. The largest are found in tropical countries, where some measure nearly a foot across the wings. They may generally be distinguished from moths by having their wings erect when sitting, the moths having theirs horizontal. Some of them have great powers of flight. Among the most remarkable butterflies are those that present an extraordinary likeness to other objects—leaves, green or withered, flowers, bark, etc., a feature that serves greatly to protect them from enemies. See *Lepidoptera* and *Mimicry*.

**Butterfly-fish.** See *Blenny*.

**Butterfly-weed,** *Asclēpias tuberōsa* (see *Asclepias*), the pleurisy-root of America, where it has a considerable reputation as an article of the materia medica. It is an expectorant, a mild cathartic, and a diaphoretic, and is employed in incipient pulmonary affections, rheumatism, and dysentery.

**Butterine** (but'ĕr-in), an artificial butter, prepared from beef suet, milk, butter, and vegetable oil, and now largely made in the United States, Holland, etc. By the use of coloring matters it can be made to resemble butter of any given brand; but although quite wholesome when well made, it has

not the delicate flavor and aroma of the highest-class butters. To prevent fraudulent sales Congress has passed a law requiring under penalty that every package containing artificial butter shall be duly marked, and that retail dealers shall not sell except from the original package.

**Buttermilk,** the milk from which butter has been extracted, forming a nutritious and agreeable cooling beverage with an acidulous taste.

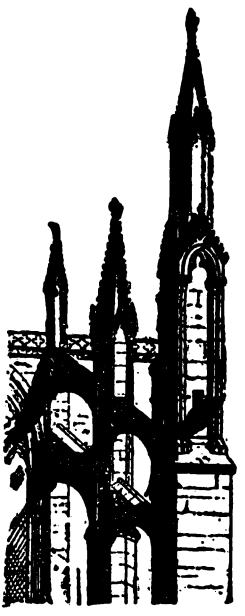
**Butternut,** the fruit of *Juglans cinĕrea*, or white walnut, an American tree, so called from the oil it contains. The tree bears a resemblance in its general appearance to the black walnut, but the wood is not so dark in color. The same name is given to the nut of *Caryocar butyracĕum* and *C. nucifĕrum* of South America, also known as *Suwarrow or Suwarra nut.*

**Butter-tree,** a name of several trees yielding oily or fatty substances somewhat resembling butter. See *Bassia, Shea.*

**Butterwort,** *Pinguicŭla vulgăris*, order Lentibulariaceæ, a plant growing in bogs or soft grounds in Europe, Canada, etc. The leaves are covered with soft, pellucid, glandular hairs, which secrete a glutinous liquor that catches small insects. The edges of the leaf roll over on the insect and retain it, and the juices of the insect thus retained serve as food for the plant. In the north of Sweden the leaves are employed to curdle milk.

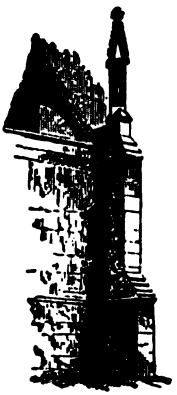
**Buttmann** (but'mân), PHILIP KARL, a German philologist, born in 1764. He spent most of his life at Berlin, where he taught in the Joachimsthal University. His best-known works are his *Greek Grammar* and *Lexilogus for Homer and Hesiod.* He died in 1829.

**Buttons** (but-uns), catches used to fasten together the different parts of dress, are of almost all forms and materials—wood, horn, bone, ivory, steel, copper, silver, brass, etc.—which are either left naked or covered with silk or some other material. The material of buttons has varied much with times and fashions. In the last century gilt, brass, or copper buttons were almost universal. Birmingham, England, was the great seat of manufacture, as it yet is of metallic and other buttons. The introduction of cloth-covered buttons early in the last century made a great revolution in the trade, and led to great varieties in the style of making up. The metal buttons now used are commonly made of brass or a mixture of tin and brass. They are usually made from sheets of metal by punching and stamping. Such buttons are generally used for trousers. A substance now very commonly used for buttons is vegetable ivory (seeds of the ivory-nut palm), which may be colored according to pleasure. Mother-of-pearl buttons are another common kind. Of late years the making of porcelain buttons has developed into a remarkable industry. These buttons are both strong and cheap. Besides these kinds there are also glass buttons, made by softening the glass by heat and pressing it into a mold; buttons of vulcanite, marble, and many other materials; but these are fancy articles in the trade.



Flying *Buttress*, St. Ouen.

**Buttresses** (but'res-es), in architecture, especially Gothic, projections on the outside of the walls of an edifice, extending from the bottom to the top, or nearly, and intended to give additional support to the walls and prevent them from spreading under the weight of the roof. *Flying buttresses*, of a somewhat arched form, often spring from the top of the ordinary buttresses, leaning inwards so as to abut against and support a higher portion of the building, such as the wall of a clere-story, thus receiving part of the pressure from the weight of the roof of the central pile.



Buttress and Flying Buttress.

**Buttonwood** (but'un-wŏd), the name usually given to the American plane tree, so called from the small, round balls it produces as seed vessels (*Platănus occidentalis*).

**Butyric Acid** (bū-tir'ik), an acid obtained from butter; it also occurs in perspiration, codliver oil, etc, Butyric acid is a colorless liquid, having a smell like that of rancid butter; its taste is acrid and biting, with a sweetish after-taste.

**Butyr'ic Ether,** a substance obtained from butyric acid, having the flavor of pineapples, used in flavoring confectionery, as an ingredient in perfumes, etc.

**Buxar',** or BAXAR', a town of Bengal, on the Ganges, 350 miles N. W. of Calcutta. The Hindus regard it as a very sacred place. Pop. 16,498.

**Buxton** (buks'ton), a town in the county of Derby, England, situated in a valley celebrated for its mineral waters, being largely visited for the purpose of drinking these waters. The surrounding scenery is fine, and there is a great stalactite cavern called Poole's Hole in the neighborhood. Pop. (1911) 10,025.

**Buxton,** SIR THOMAS FOWELL, an English philanthropist, born in 1786, and educated at Trinity College, Dublin. In 1811 he joined the firm of the celebrated brewers, Truman, Hanbury, & Co., and took an active share in the business. The Spitalfields distress in 1816 was the occasion of his turning his attention to philanthropic efforts, and along with his sister-in-law, the celebrated Mrs. Fry, he made inquiries which directed public attention to the system of prison discipline. In 1818 he was elected M.P. for Weymouth, and was long the able coadjutor of Wilberforce in his efforts for the abolition of slavery. He was created a baronet in 1840 and died in 1845.

**Buxtorf** (buks'torf), JOHANN, a German orientalist, was born in 1564, and became professor at Basel, where he died in 1629. His chief work is *Lexicon Chaldaicum Talmudicum et Rabbinicum*. His son Johann, born at Basel, was equally eminent as a Hebrew scholar, and succeeded to his father's chair. He died in 1664.

**Bux'us.** See *Box-tree.*

**Buyuk'dere** (bö-yök'dā ā), a town on the European shore of the Bosporus, 10 miles from Constantinople. It is famous for its scenery, and is a favorite residence of the Christian ambassadors.

**Buzzard** (buz'ard), the name or raptorial birds which form one of the subfamilies of the diurnal birds of prey; characters, a moderate-sized beak, hooked from the base, long wings, long tarsi, and short weak toes. The common buzzard (*Butĕo vulgăris*) is distributed over the whole of Europe as well as the north of Africa and Western Asia. Its food is very miscellaneous, and consists of moles, mice, frogs, toads, worms, insects, etc. It is sluggish in its habits. Its length is from 20 to 22 inches. The rough-legged buzzard (*B. lagōpus*), so called from having its legs feathered to the toes, is a native of Britain. Its habits resemble those of the common buzzard. The red-tailed hawk of the United States is a buzzard (*B. borealis*). It is also called hen-hawk, from its raids on the poultry-yard. The genus *Pernis*, to which the honey-buzzard (*P. apivŏrus*) belongs, has the beak rather weaker than *Buteo*, but does not differ much from that genus. The honey-buzzard is so called because feeding specially on bees and wasps. The turkey buzzard, so common in the Southern United States, where it is esteemed and protected as a destroyer of carrion, is not a true buzzard, but a vulture, belonging to the genus *Catharista*, of the family *Vulturidæ*.

**Byblos** (bib'los), an ancient maritime city of Phœnicia, now called Jebail, a little north of Beyrout. It was the chief seat of the worship of Adonis or Thammuz.

**By-law,** BYE-LAW (from the Scand. *by*, a town), a law made by an incorporated or other body for the regulation of its own affairs, or the affairs intrusted to its care. Town-councils, railway companies, and chartered societies of all kinds, etc., enact by-laws which are binding upon all coming within the sphere of the operations of such bodies. By-laws must of course be within the meaning of the charter of incorporation and in accordance with the law of the land.

**Byng,** SIR JULIAN K. G., born in 1862, a younger son of the Earl of Stratford. He joined the Royal Hussars in 1882, gradually advanced in rank, was made major-general in 1909, and reached the rank of lieutenant-general in the European war. He served in the Dardanelles campaign, and in November, 1917, commanded the highly successful surprise attack on the German lines before Cambrai, carried out with the aid of 'tanks.'

**Byrom** (bī'rom), JOHN, an English poet and stenographer, born in 1692; died in 1763. He was educated at Merchant Taylors' School and Trinity College, Cambridge, and for some time

studied medicine, but his chief means of livelihood for many years till he inherited the family estates in 1740, was teaching shorthand on a system invented by himself. He was on friendly terms with many of the eminent men of his time. His earliest writings were a few papers to the *Spectator;* his poems (collected in 1773) were chiefly humorous and satirical, and show remarkable facility in rhyming.

**Byron** (bi'ron), GEORGE GORDON NOEL, LORD BYRON, a great English poet, was born in Holles Street, London, in 1788. He was the grandson of Admiral John Byron, and son of the admiral's only son, Captain John Byron, of the Guards, so notorious for his gallantries and reckless dissipation that he was known as 'Mad Jack Byron.' His mother was Catherine Gordon, of Gight, in Aberdeenshire, who was left a widow

Lord Byron.

in 1791. Mrs. Byron retired with her young child to Aberdeen, where she lived in seclusion on the ruins of her fortune. Till the age of seven he was entirely under the care of his mother, and to her injudicious indulgence the waywardness that marked his after career has been partly attributed. On reaching his seventh year he was sent to the grammar-school at Aberdeen, and four years after, in 1798, the death of his grand-uncle gave him the titles and estates of the family. Mother and son then removed to Newstead Abbey, the family seat, near Nottingham. Soon after Byron was sent to Harrow, where he distinguished himself by his love of manly sports and his undaunted spirit. While at school he fell deeply in love with Miss Chaworth, a distant cousin of his own. But the lady slighted the homage of the Harrow schoolboy, her junior by two years, and married another and more mature suitor. In *The Dream* Byron alludes finely to their parting interview. In 1805 he was entered at Trinity College, Cambridge. Two years after, in 1807, appeared his first poetic volume, *Hours of Idleness*, which, though indeed containing nothing of much merit, was castigated with overseverity by Brougham in the *Edinburgh Review*. This caustic critique roused the slumbering energy in Byron, and drew from him his first really notable effort, the celebrated satire *English Bards and Scotch Reviewers*. In 1809, in company with a friend, he visited the southern provinces of Spain, and voyaged along the shores of the Mediterranean. The fruit of these travels was the fine poem of *Childe Harold's Pilgrimage*, the first two cantos of which were published on his return in 1812. The poem was an immense success, and Byron 'awoke one morning and found himself famous.' His acquaintance was now much courted, and his first entry on the stage of public life may be dated from this era. During the next two years (1813–14) the *Giaour*, the *Bride of Abydos*, the *Corsair*, *Lara*, and the *Siege of Corinth* showed the brilliant work of which the new poet was capable. In 1815 Byron married Anna Isabella, only daughter of Sir Ralph Milbanke, but the marriage proved unfortunate, and in about a year Lady Byron, who had gone on a visit to her parents, refused to return, and a formal separation took place. This rupture produced a considerable sensation, and the real cause of it has never been satisfactorily explained. It gave rise to much popular indignation against Byron, who left England, with an expressed resolution never to return. He visited France, the field of Waterloo and Brussels, the Rhine, Switzerland, and the north of Italy, and for some time took up his abode at Venice, and later at Rome, where he completed his third canto of *Childe Harold*. Not long after appeared the *Prisoner of Chillon, The Dream and other Poems;* and in 1817 *Manfred*, a tragedy, and the *Lament of Tasso*. From Italy he made occasional excursions to the islands of Greece, and at length visited Athens, where he sketched many of the scenes of the fourth and last canto of *Childe Harold*. In 1819 was published the romantic tale of *Mazeppa*, and the same year was marked by the commencement of *Don Juan*. In 1820 appeared *Marino Faliero, Doge of Venice*, a tragedy; the drama of *Sardanapalus;* the *Two Foscari*, a tragedy; and *Cain*, a mystery. After leaving Venice Byron resided for some time at Ravenna, then at

Pisa, and lastly at Genoa. At Ravenna he became intimate with the Countess Guiccioli, a married lady; and when he removed to Pisa, in 1822, she followed him. There he continued to occupy himself with literature and poetry, sustained for a time by the companionship of Shelley, one of the few men whom he entirely respected and with whom he was quite confidential. Besides his contributions in the *Liberal*, a periodical established at this time in conjunction with Leigh Hunt and Shelley, he completed the later cantos of *Don Juan*, with *Werner*, a tragedy, and the *Deformed Transformed*, a fragment. These are the last of Byron's poetical efforts. In 1823, troubled perhaps by the consciousness that his life had too long been unworthy of him, he conceived the idea of throwing himself into the struggle for the independence of Greece. In January, 1824, he arrived at Missolonghi, was received with the greatest enthusiasm, and immediately took into his pay a body of 500 Suliotes. The disorderly temper of these troops, and the difficulties of his situation, together with the malarious air of Missolonghi, began to affect his health. On the 9th April, 1824, while riding out in the rain, he caught a fever, which ten days later ended fatally. Thus, in his thirty-seventh year died prematurely a man whose natural force and genius were perhaps superior to those of any Englishman of his time, and, largely undisciplined as they were, and wasted by an irregular life, they acquired for him a name second, in the opinion of continental Europe at least, to that of no other Englishman of his time. The body of Byron was taken to England and interred in Hucknall-Torkard church, Notts.

**Byron,** HENRY JAMES, an English dramatist and actor, born in 1834; died in 1884. He wrote an immense number of pieces, including a great many farces, burlesques, and extravaganzas, besides comedies or domestic dramas, such as *Cyril's Success; Dearer than Life; Blow for Blow; Uncle Dick's Darling; the Prompter's Box; Partners for Life;* and *Our Boys*, the last having an extraordinary success.

**Byron,** JOHN, an English admiral, grandfather of the poet Lord Byron, was born in 1723. Embarking as midshipman in one of the ships of Lord Anson, which was wrecked on the Pacific coast (1741), north of the Straits of Magellan, he published a narrative of his adventures amongst the Indians which is extremely interesting. In 1758 he commanded three ships of the line and distinguished himself in the war against France. In June, 1764, he set out in a frigate to circumnavigate the globe, returning to England in May, 1766. From 1769 to 1775 he was governor of Newfoundland. He was made vice-admiral of the white in 1779, and died in 1786.

**Byssus** (bis'us), a name given to the hair or threadlike substance (called also *beard*), with which the different kinds of sea-mussels fasten themselves to the rocks. The *Pinna nobilis*, particularly, is distinguished by the length and the silky fineness of its beard, from which cloths, gloves, and stockings are still manufactured (mainly as curiosities) in Sicily and Calabria.

**Byttneriaceæ** (bit-ner-i-ā'se-ē), a natural order of plants allied to the mallows. Almost all the species contain a fatty oil in their seeds, and have a fibrous bast. The typical genus is *Byttneria*, from which the order is named, but by far the most important is *Theobroma* to which the tree yielding cocoa (cacao) belongs.

**Byzantine** (bi-zan'tin, biz'an-tin) ART, a style which arose in Southeastern Europe after Constantine

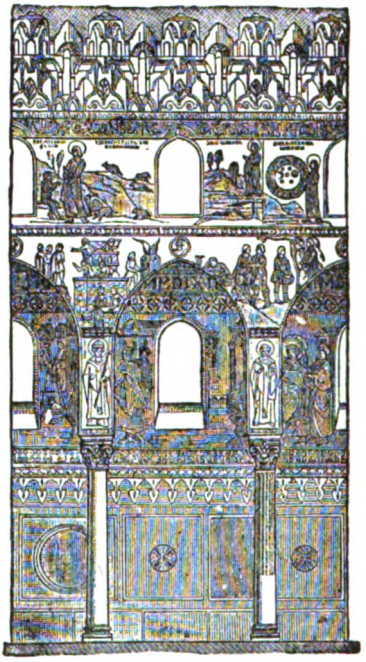
Byzantine Architecture.—Ancient Cathedral, Athens.

the Great had made Byzantium the capital of the Roman Empire (330 A.D.) and ornamented that city, which was called after him, with all the treasures of Grecian art. (See *Byzantine Empire*). One of the chief influences in Byzantine art was Christianity, and to a certain extent Byzantine art may be rec-

ognized as the endeavor to give expression to the new elements which Christianity had brought into the life of men. The tendency towards Oriental luxuriance and splendor of ornament now quite supplanted the simplicity of ancient taste. Richness of material and decoration was the aim of the artist rather than purity of conception. Yet the classical ideals of art, and in particular the traditions of technical processes and methods carried to Byzantium by the artists of the Western Empire, held their ground long enough, and produced work pure and powerful enough, to kindle the new artistic life which began in Italy with Cimabue and Giotto.

With regard to *sculpture* the statues no longer displayed the freedom and dignity of ancient art. The true proportion of parts, the correctness of the outlines, and in general the severe beauty of the naked figure, or of simple drapery in Greek art, were neglected for extravagant costume and ornamentation and petty details. Yet in the best period of Byzantine art, from the 6th to the 11th century, there is considerable spiritual dignity in the general conception of the figures. But sculpture was of second-rate importance at Byzantium, the taste of those times inclining more to mosaic work with the costliness and brilliant colors of its stones. The first germ of a Christian style of art was developed in the Byzantine *pictures*. The artists, who appear to have seldom employed the living model, and had nothing real and material before them, but were obliged to find, in their own imaginations, conceptions of the external appearance of sacred persons, such as the mother of Christ or the apostles, could give but feeble renderings of their ideas. As they cared but little for a faithful imitation of nature, but were satisfied with repeating what was once acknowledged as successful, it is not strange that certain forms, approved by the taste of the time, should be made, by convention, and without regard to truth and beauty, general models of the human figure, and be transmitted as such to succeeding times. In this way the artists in the later periods did not even aim at accuracy of representation, but were contented with stiff general outlines, lavishing their labor on ornamental parts.

Byzantine *architecture* may be said to have assumed its distinctive features in the Church of St. Sophia built by Justinian in the sixth century, and still existing as the chief mosque in Constantinople. It is more especially the style associated with the Greek Church as distinguished from the Roman. The leading forms of the Byzantine style are the round arch, the circle, and in particular the dome. The last is the most conspicuous and characteristic object in Byzantine buildings, and the free and full employment of it was arrived at when by the use of pendentives the architects were enabled to place it on a square apartment instead of a circular or polygonal. In this style of building the incrustation of brick with more precious materials was largely in use. It depended much on color and surface ornament for its effect, and with



BYZANTINE ARCHITECTURE.
Part of the Nave of the Palatine chapel, Palermo.

this intent mosaics wrought on grounds of gold or of positive color are profusely introduced, while colored marbles and stones of various kinds are greatly made use of. The capitals are of peculiar and original design, the most characteristic being square and tapering downwards, and they are very varied in their decorations. Byzantine architecture may be divided into an older and a newer (or Neo-Byzantine) style. The most distinctive feature of the latter is that the dome is raised on a perpendicular circular or polygonal piece of masonry (technically the *drum*)

containing windows for lighting the interior, while in the older style the light was admitted by openings in the dome itself. The Cathedral of Athens (shown in the accompanying cut) is an example of the Neo-Byzantine style. The Byzantine style had a great influence on the architecture of Western Europe, especially in Italy, where St. Mark's in Venice is a magnificent example, as also in Sicily. It had also material influence in Southern France and Western Germany.

**Byzantine** EMPIRE, the Eastern Roman Empire, so called from its capital Byzantium or Constantinople. The Byzantine Empire was founded in A.D. 395, when Theodosius at his death divided the Roman Empire between his sons Arcadius and Honorius. In this empire the Greek language and civilization were prevalent; but the rulers claimed still to be Roman emperors, and under their sway the laws and official forms of Rome were maintained. It lasted for about a thousand years after the downfall of the Western Empire. It is also known as the *Greek Empire* or *Lower Empire*. Its capital was naturally Constantinople, a city established by Constantine in 330 on the site of the ancient Byzantium as the new capital of the whole Roman Empire.

The Eastern Empire, then comprising Asia Minor, Syria, Egypt, Greece, Thrace, Mœsia, Macedonia, and Crete, fell to Theodosius's elder son Arcadius, through whose weakness and that of several of his immediate successors it suffered severely from the encroachments of Huns, Goths, Bulgarians, and Persians. In 527 the celebrated Justinian succeeded, whose reign is famous for the codification of Roman law, and the victories of his generals Belisarius and Narses over the Vandals in Africa, and the Goths in Italy, which was henceforth governed for the Eastern Empire by an *exarch* residing at Ravenna. But his energy could not revive the decaying strength of the empire, and Justin II, his successor (565–578), a weak and avaricious prince, lost his reason by the reverses encountered in his conflicts with plundering Lombards, Avars, and Persians. Tiberius, a captain of the guard, succeeded in 578, and in 582 Mauricius; both were men of ability. In 602 Phocas, proclaimed emperor by the army, succeeded, and produced by his incapacity the greatest disorder in the empire. Heraclius, son of the governor of Africa, who headed a conspiracy, conquered Constantinople, and caused Phocas to be executed (610). He was an excellent general, and finally succeeded in repressing the Avars and recovering the provinces lost to the Persians, whose power indeed he overthrew. But a far more dangerous enemy to the Byzantine empire now appeared in the Moslem power, founded amongst the Arabians by Mohammed and the caliphs, which gradually extended its conquests over Phœnicia, the countries on the Euphrates, Judea, Syria, and Egypt (635–641). In 641 Heraclius died, nor was there among his descendants a single prince capable of stemming the tide of Moslem invasion. The Arabians took part of Africa, Cyprus, and Rhodes (653), inundated Africa and Sicily, penetrated into Thrace, and attacked Constantinople by sea.

The empire was in sore straits when Leo the Isaurian (Leo III), general of the army of the East, mounted the throne (716), and a new period of comparative prosperity began. Some writers date the beginning of the Byzantine Empire proper, and the end of the Eastern Roman Empire, from this era. Numerous reforms, civil and military, were now introduced, and the worship of images was prohibited. Leo repelled the Arabians or Saracens from Constantinople, but allowed the Lombards to seize the Italian provinces, while the Arabians plundered the Eastern ones. Constantine V (741) recovered part of Syria and Armenia from the Arabians; and the struggle was carried on not unsuccessfully by his son Leo IV. Under his grandson, Constantine VI, Irene, the ambitious mother of the latter, raised a large faction by the restoration of image worship, and, in conjunction with her paramour Stauratius, deposed her son, and had his eyes put out (797). A revolt of the patricians placed one of their order, Nicephorus, on the throne, who fell in the war against the Bulgarians (811). Stauratius, Michael, Leo V and Michael II (820) ascended the throne in rapid succession. During the reign of the latter the Arabians conquered Sicily, Lower Italy, Crete, and other countries. The long dispute as to image-worship was brought to a close in 842, when the practice was finally sanctioned at the council of Nicæa, under Michael III. He was put to death by Basil the Macedonian, who came to the throne as Basil I in 867, and whose reign formed a period of great glory in the history of the Byzantine Empire. He founded a dynasty (the *Macedonian*) which lasted till 1056. Among the greatest of his successors were Nicephorus II (Phocas), and John Zimisces (969), who carried on successful

wars against the Mohammedans, Bulgarians, and Russians. Basil II succeeded this prince (976). He vanquished the Bulgarians and the Arabians. His brother, Constantine IX (1025), was succeeded by Romanus III (1028), who married Zoe, daughter of Constantine. This dissolute but able princess caused her husband to be executed, and successively raised to the throne Michael IV (1034), Michael V (1041), and Constantine X (1042). Russians and Mohammedans meanwhile devastated the empire. Her sister Theodora succeeded her on the throne (1054).

After the short reign of Michael VI (1054–57) Isaac Comnenus, the first of the *Comnenian* dynasty, ascended the throne, but soon after became a monk. The three chief emperors of this dynasty were Alexius, John, and Manuel Comnenus. During the reign of Alexius I (1081–1118) the Crusades commenced. His son, John II, and grandson, Manuel I, fought with success against the Turks, whose progress also was considerably checked by the Crusades. The Latins, the name given to the French, Venetian, etc., crusaders, now forced their way to Constantinople (1204), conquered the city, and retained it, together with most of the European territories of the empire. Baldwin, count of Flanders, was made emperor; Boniface, marquis of Montferrat, obtained Thessalonica as a kingdom, and the Venetians acquired a large extent of territory. Theodore Lascaris seized on the Asiatic provinces, in 1206 made Nice (Nicæa), the capital of the empire, and was at first more powerful than Baldwin. Neither Baldwin nor his successors, Henry, Peter, and Robert of Courtenay, were able to secure the tottering throne. John, emperor of Nice, conquered all the remaining Byzantine territory except Constantinople, and at last, in 1261, Michael Palæologus, King of Nice, conquered Constantinople, and thus overthrew the Latin dynasty.

Thus again the vast but exhausted Byzantine Empire was united under Michael *Palæologus*, founder of the last Byzantine dynasty. Internal troubles and wars with the Turks disturbed the reigns of his descendants, Andronicus II and Andronicus III. For a time the Cantacuzenes shared the crown with John Palæologus, son of Andronicus III; but in 1355 John again became sole emperor. In his reign the Turks first obtained a firm footing in Europe, and conquered Gallipoli (1357). In 1361 Sultan Amurath took Andrianople. Bajazet conquered almost all the European provinces except Constantinople, and was pressing it hard when Timur's invasion of the Turkish provinces saved Constantinople for this time (1402). Manuel, then emperor, recovered his throne, and regained some of the lost provinces from the contending sons of Bajazet. To him succeeded his son John Palæologus II (1425), whom Amurath II stripped of all his territories except Constantinople, and laid under tribute (1444). To the Emperor John succeeded his brother Constantine Palæologus. With the assistance of his general Giustiniani, a Genoese, he withstood the superior forces of the enemy with fruitless courage, and fell in the defense of Constantinople, by the conquest of which (May 29, 1453) Mohammed II put an end to the Greek or Byzantine Empire. The Byzantine Empire which thus lasted for over a thousand years, was of immense service to the world in stemming the tide of Mohammedan advance, in extending Christianity and civilization, and in maintaining a regular system of government, law, and policy in the midst of surrounding barbarism.

**Byzantium** (bi-zan'ti-um), the original name of the city of Constantinople. It was founded by Greek colonists in 658 B.C., and owing to its favorable position for commerce it attained great prosperity, and survived the decay of most of the other Greek cities. In A.D. 330 a new era began for it when Constantine the Great made it the capital of the Roman Empire. See *Constantinople.*

# C

**C**, the third letter in the English alphabet and the second of the consonants. In English it serves to represent two perfectly distinct sounds, namely, the guttural sound pertaining to *k* and the hard or thin sound of *s*, the former being that which historically belongs to it; while it also forms with *h* the digraph *ch*. The former sound it has before the vowels *a*, *o*, and *u*, the latter before *e*, *i*, and *y*. The digraph *ch* has three different sounds, as in *church*, *chaise*, and *chord*. To these the Scotch adds a fourth, heard in the word *loch*.

**C**, in music, (*a*) after the clef, the mark of common time, in which each measure is a semibreve of four minims, corresponding to 2-2 or 4-4; and when a bar is perpendicularly drawn through it *alla-breve* time or a quicker movement is indicated. (*b*) The name of the first or keynote of the modern normal scale, answering to the *do* of the Italians and the *ut* of the French.

**Caaba** (kä'a-bä). See *Kaaba*.

**Caaing Whale** (kä'ing; Scotch name, meaning 'driving whale,' whale that may be driven), the round-headed porpoise (*Globicephălus deductor*, *Delphinus melas*, or *D. globiceps*), a cetaceous animal of the dolphin family, characterized by a rounded muzzle and a convex head, attaining a size of 16 to 24 feet. It frequents the shores of Orkney, Shetland, the Faroe Islands, and Iceland, appearing in herds of from 200 to 1000, and numbers are often caught. They live on cod, ling, and other large fish, and also on molluscs, especially the cuttle-fishes. They yield a considerable quantity of oil and the flesh and blubber are eaten in Scotland.

**Cab** (short for the original name *cabriolet*), a kind of hackney-carriage with two or four wheels drawn by one horse. The original cab was for only one passenger besides the driver, and was a kind of hooded chaise.

**Cabal** (cab-al'), a name applied in English history to the ministry under Charles II, which consisted of Sir Thomas, afterwards Lord Clifford, Lord Ashley, afterwards Earl of Shaftesbury, George Villiers, Duke of Buckingham, Henry, Lord Arlington, and John, Duke of Lauderdale; the initials of whose names happened to compose the word *cabal*. This term (which existed long before, and was derived from *cabala*) is applied to any junto united in some close design, usually to promote their private ends by intrigue.

**Cabala**, or CAB'BALA (kab'a-la), a mysterious kind of science or knowledge among Jewish rabbins, pretended to have been delivered to the ancient Jews by revelation—specifically to Moses on Sinai—and transmitted by oral tradition, serving for the interpretation of difficult passages of Scripture. This science consists chiefly in understanding the combination of certain letters, words, and numbers which are alleged to be significant. Every letter, word, number, and accent of the law is supposed to contain a mystery, and the cabalists pretend even to foretell future events by the study of this science.

**Caballero** (ka-bä-lyer'ō), FERNAN, pseudonym of Cecilia Böhl von Faber, the chief modern Spanish novelist, daughter of a German settled in Spain and married to a Spanish lady; born 1797; died 1877. Her first novel, *La Gaviota*, appeared in 1849, and was followed by *Elia*, *Clemencia*, *La Familia de Alvareda*, etc., as well as by many shorter stories. The chief charm of her writings lies in her descriptions of life and nature in Andalusia. She was three times left a widow; her last husband's name was De Arrom.

**Cabanis** (k ä b-ä-n ē s), PIERRE JEAN GEORGES, a French physician, philosopher, and *littérateur*, born in 1757, died in 1808. He became acquainted with Madame Helvetius, and through her with Holbach, Franklin, and Jefferson, and became the friend of Condillac, Turgot, and Thomas. He professed the principles of the revolution, and was intimately connected with Mirabeau. His *Rapports du Physique et du Moral de l'Homme* is his most important work. It displays considerable

power of analysis, and advocates the most extreme materialistic doctrines. He afterwards changed his opinions and adopted theistic views.

**Cabatuan** (kä-bä-tö-än'), a pueblo of the island of Panay, one of the Philippines. Rice, maize, tobacco, sugar-cane, etc., are grown here. Pop. 16,497.

**Cabbage** (kab'äj), the popular name of various species of cruciferous plants of the genus *Brassica*, and especially applied to the plain-leaved, hearting, garden varieties of *B. oleracĕa*, cultivated for food. The wild cabbage is a native of Europe. The kinds most cultivated are the common cabbage, the savoy, the broccoli, and the cauliflower. The common cabbage forms its leaves into heads or bolls, the inner leaves being blanched. Its varieties are the white, the red or purple, the tree or cow cabbage for cattle (branching and growing when in flower to the height of 10 feet), and the very delicate Portugal cabbage. The garden sorts form valuable culinary vegetables, and are used at table in various ways. In Germany pickled cabbage forms a sort of national dish known as *sauerkraut*.

**Cabbage-bark.** See *Andira*.

**Cabbage-butterfly,** a name given to several species of butterfly, especially *Pontia* or *Pieris brassicæ*, a large white butterfly, the larvæ of which destroy cruciferous plants, particularly of the cabbage tribe.

**Cabbagefly** (*Anthomyia brassicæ*), a fly belonging to the same family (Muscidæ) as the housefly and the same genus as the turnip and potato flies. Its larvæ or maggots are destructive to cabbages by producing disease in their roots, on which they feed.

**Cabbage-moth,** the *Mamestra* or *Noctua brassicæ*, a moth measuring about 1¾ inches across the open forewings, which are dusky brown, clouded with darker shades, and marked with dark spots, as also various streaks and spots of a yellowish or white color. The caterpillar is greenish black, and is found in autumn feeding on the hearts of cabbages.

**Cabbage-palm,** a name given to various species of palm-trees from the circumstance that the terminal bud, which is of great size, is edible and resembles cabbage, as the *Arĕca oleracĕa*, a native of the West Indies, the simple unbranched stem of which grows to a height of 150 or even 200 feet. The unopened bud of young leaves is much prized as a vegetable, but the removal of it completely destroys the tree, as it is unable to produce lateral buds.

**Cabbage-rose,** a species of rose (*Rosa centifolia*) of many varieties, supposed to have been cultivated from ancient times, and eminently fitted for the manufacture of rose-water and attar from its fragrance. It has a large, rounded, and compact flower. Called also *Provence rose*.

**Cabbage-tree,** a name given to the cabbage-palm, and also to a tree of the genus *Andira* (which see).

**Cab'bala.** See *Cabala*.

**Cabeiri.** See *Cabiri*.

**Caber** (kā'ber), the undressed stem of a tree, 20 or more feet long, used at Highland games as a trial of strength, being held upright by the smaller end and tossed so as to strike the ground with the other end and then turn over.

**Cabes** (kā'bes), or GABES, a town and port of Tunis, with a small trade. The Gulf of Cabes (*Syrtis Minor*), at the head of which the town is situated, lies between the islands of Kerkenna and Jerba. Pop. about 12,000.

**Cabinda** (kä-bin'dä), a Portuguese seaport and territory, north of the Congo mouth, bounded by the Atlantic, the Congo State, and the French Congo territory. The town carries on a considerable trade, and its people are noted for their shipbuilding and other handicrafts. Pop. 10,000.

**Cabinet** (kab'i-net), a collective body of ministers who direct the government of a country. In the United States government the cabinet consists of the heads of the government departments and consulting advisers of the president. They include the secretaries of state, treasury, war, navy, interior, agriculture, commerce, and labor, the attorney-general, and postmaster-general. They meet whenever desired by the president, but not publicly. No minutes are kept of their proceedings. The president presides. The British cabinet is a similar body of heads of departments and other ministerial functionaries, its head being the premier, or prime minister, who represents the crown in dealing with parliament.

**Cabiri,** CABEIRI (ka-bī'rī), deities or deified heroes worshiped in the ancient Greek islands of Lemnos. Im-

bros, and Samothrace, and also on the neighboring coast of Troy in Asia Minor.

**Cable** (kā'bl), a large strong rope or chain, such as is used to retain a vessel at anchor. It is made usually of hemp or iron, but may be made of other materials. A hemp cable is composed of three strands, each strand of three ropes, and each rope of three twists. A ship cable is usually 120 fathoms or 720 feet in length; hence the expression *a cable's length*. Chain-cables have now almost superseded rope-cables. Although deficient in elasticity, heavier, and more difficult of management, yet their immunity from chafing and rotting, their greater compactness for stowage, and the fact that from their greater weight the strain is exerted on the cable rather than on the ship, more than counterbalance these drawbacks.—A *submarine telegraph cable* is composed of one or more copper wires embedded in a compound of gutta percha and resinous substances, encircled by layers of gutta percha or India rubber, hemp or jute padding, and coils of iron wire. The submarine cables of the world number 417, with a total length of 235,492 nautical miles. Cables owned by various nations number 2166, length 55,207 miles. These range in length from a quarter of a mile to over 15,000 miles. Total cost over $250,000,000.

**Cable** (kā'bl), GEORGE WASHINGTON, novelist, born in New Orleans, Oct. 12, 1844. He served in the Confederate army 1863–65, was a reporter on the New Orleans *Picayune* 1865–79, and afterwards began a series of novels descriptive of Creole life in Louisiana, and introducing a dialect new to fiction. Chief among these are *Old Creole Days*, *The Grandissimes*, *Dr. Sevier*, *Madame Delphine*, and *John March, Southerner*. In 1897 he became editor of *Current Literature*, New York. In 1887 he founded the Home-Culture Clubs, designed to promote more cordial relations between the divergent grades of society.

**Cabot** (kab'ot), SEBASTIAN, navigator, was born at Bristol about 1474; died about 1557. He was the son of John Cabot, a Venetian pilot, who resided at Bristol, and was highly esteemed for his skill in navigation. In 1497 he probably sailed with his father, John Cabot, on a voyage of discovery to America, and on a later voyage traced the mainland of America for a long distance. He afterward entered the Spanish Service and in 1526 made a voyage to Brazil and the River Platte. In 1548 he again settled in England, and received a pension from Edward VI. He published a large map of the world, as then known.

Sebastian Cabot.

**Cabra** (kȧb'rȧ), a town of Spain, Andalusia, in the province of Cordova, in a valley almost environed by mountains. The neighboring region produces excellent wine. Pop. 13,127.

**Cabral** (kȧ-brȧl'), PEDRO ALVAREZ, the discoverer (or second discoverer) of Brazil, a Portuguese navigator, born about 1460; died about 1526. In 1500 he received command of a fleet bound for the East Indies, and sailed from Lisbon, but having taken a course too far to the west he was carried by the South American current to the coast of Brazil, of which he took possession in the name of Portugal. Continuing his voyage, he visited Mozambique, and at last reached India, where he made important commercial treaties with native princes, and then returned to Europe.

**Cabrera** (kȧ-brā'rȧ), a small Spanish island, one of the Balearic Isles, used as a place for receiving convicts.

**Cabul,** KABUL (kä'bul, ka-bŏl'), capital of the kingdom of Afghanistan, 80 miles N. N. E. of Ghuzni. It stands on the Cabul river, at an elevation of 7280 feet above sea-level. The citadel, Bala-Hissar, contains the palace and other public buildings, the fort, etc. Cabul carries on a considerable trade with Hindustan through the Khyber Pass. It was taken by the British in 1839 and in 1842, and on the occasion of a subsequent war with the British in 1879 Cabul was twice taken by their troops. Pop. about 60,000. The Cabul river rises in Afghanistan at the height

of about 8400 feet, flows eastward, passes through the Khyber Pass into India, and falls into the Indus at Attock. Length 300 miles.

**Cacao,** or Cocoa (kȧ-kā'ō, kō'kō), the chocolate-tree (*Theobroma cacao*), nat. order Byttneriaceæ, and also the powder made from the fruit of this tree and the beverage obtained from it. The tree is 16 to 18 feet high, a native of tropical America, and much cultivated in the tropics of both hemispheres, especially in the West India Islands, Central and South America. Its fruit is contained in pointed, oval, ribbed pods 6 to 10 inches long, each inclosing 50 to 100 seeds in a white, sweetish pulp. These are very nutritive, containing 50 per cent of fat, are of an agreeable flavor, and are used, both in their fresh state and when dried, as an article of diet. Cocoa and chocolate are made from them, the former being a powder obtained by grinding the seeds, and often mixed with other substances when prepared for sale, the latter being this powder mixed with sugar and various flavoring matters and formed into solid cakes. The seeds when roasted and divested of their husks and crushed are known as *cocoa nibs*. The seeds yield also an oil called butter of cacao, used in pomatum and for making candles, soap, etc. The term *cocoa* is a corruption of *cacao*, but is more commonly used in commerce; *cocoanuts*, however, are obtained from an entirely different tree. (See *Cocoanut*).

**Caceres** (kā'the-res), a town of Western Spain, Estremadura, capital of a province of the same name, with an episcopal palace, an old castle, and the largest bull-ring in Spain. Pop. 16,933. Pop. of province, 362,164, area, 7667 sq. miles.

**Cachalot** (kash'a-lot). See *Sperm-whale.*

**Cachar** (kȧ-char'), an East Indian district in Assam; area, 3769 sq. miles. Pop. 455,593, the people entirely engaged either in rice cultivation, on the tea plantations, or in cotton raising.

**Cache** (kȧsh; Fr.), a hole in the ground for hiding and preserving provisions which it is inconvenient to carry: used by settlers in the western states of America and by Arctic explorers.

**Cachet** (kȧ-shā), Lettre de, a name given in former times especially to letters proceeding from and signed by the kings of France, and countersigned by a secretary of state. They were at first made use of occasionally as a means of delaying the course of justice, but they appear to have been rarely employed before the 17th century as warrants for the detention of private citizens, and for depriving them of their personal liberty. During the reign of Louis XIV their use became frightfully common, and by means of them persons were imprisoned for life or for a long period on the most frivolous pretexts. They were abolished at the revolution.

**Cachexy** (ka-kek'si), Cachexia (Gr., 'evil habit of body'), a morbid state of the bodily system, in which there is great weakness, with or without the local manifestation of some constitutional disease. It is not a disease of itself, but the result of disease.

**Cachoeira** (kȧ-sho-ā'i-rȧ), a town of Brazil, in the province and 62 miles N. W of Bahia. Pop. 11,000.

**Cacholong** (kash'o-long), a mineral of the quartz family, a variety of opal, and often called *Pearl-opal*, usually milk-white, sometimes grayish or yellowish-white, opaque or slightly translucent at the edges.

**Cacholot.** See *Sperm-whale.*

**Cachou** (ka-shō'), a sweetmeat in the form of a pill, made from the extract of liquorice, cashew-nut, gum, etc., used by smokers to sweeten the breath.

**Cachuca** (kȧ-chō'kȧ), a Spanish dance performed by a man and woman to a lively, graceful air in triple time and with a strongly marked accent.

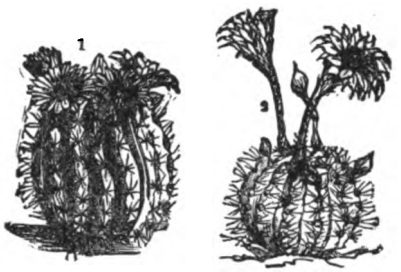
**Cacique** (ka-sēk'), in some parts of America the title of the native chiefs at the time of the conquest by the Spaniards.

**Cac'odyle.** See *Kakodyle.*

**Cacolet** (k a k' ō - l ā), a contrivance somewhat resembling a double armchair, or in other cases like a bed, fixed on the back of a mule or horse for carrying sick persons or travelers in mountainous countries.

**Cactus** (kak'tus), a Linnæan genus of plants, now used as a name for any of the Cactaceæ, a natural order of dicotyledons, otherwise called the Indian fig order. The species are succulent shrubs, with minute scale-like leaves (except in the genus *Pereskia*, tree-cactus, with large leaves), and with clusters and spines on the stems. They have fleshy stems, with sweetish watery or milky juice, and they assume many peculiar forms. The juice in some species affords a refreshing beverage where water is not to be got. All the plants of this order,

except a single species, are natives of America. They are generally found in very dry localities. Some are epiphytes. Their desert habitat and their succulence render them very desirable food for the desert animals, and their close covering of sharp spines is needed to protect them. Several have been introduced into the Old World, and in many places they have become naturalized, and a spineless




CACTI.
1, *Echinocactus centeterius*. 2, *E. oxygonus*.

cactus has recently been introduced. The fruits of some species are edible, as the prickly-pear and the Indian fig, cultivated throughout the Mediterranean region. The flowers are usually large and beautifully colored, and many members of the order are cultivated in hothouses. The principal genera are *Melocactus*, *Echinocactus*, *Opuntia*, *Cereus*, and *Mammillaria*.

**Cadamosto** (kä-dä-mos'tō), ALOISDA, an early navigator, was born at Venice about 1432; died in 1464. He explored the west coast of Africa as far south as the Gambia. His *Book of the First Voyage over the Ocean to the Land of Negroes in Lower Ethiopia* was published in 1507.

**Cadastral Survey** (ka-das'tral), a detailed survey of the lands of a country, their extent, divisions, and subdivisions, nature of culture, etc.; in most countries executed by the government as the basis of an assessment for fiscal purposes.

**Caddis-fly** (kad'is), an insect of the genus *Phryganea*, order Neuroptera, called also the *May fly*, the larva or grub of which (caddis or case-worm) forms for itself a case of small stones, grass-roots, shells, etc., lives under water till ready to emerge from the pupa state, and is used as bait by anglers. This grub is very rapacious, and devours large quantities of fish-spawn.

**Cade** (kād), JOHN (better known as *Jack Cade*), a popular agitator of the 15th century, leader of an insurrection of the common people of Kent (1450) in the reign of Henry VI. Having defeated a force sent against him, he advanced to London, which he ruled for two days. On a promise of pardon being given the rebels soon dispersed, but Cade himself was killed by a gentleman of Kent named Iden.

**Cadelle** (ka'del; *Trogosita Mauritanica*), a coleopterous insect the larva of which, in Europe, commits great ravages among stored corn and meal, and also attacks bread, almonds, and even rotten wood. The perfect insect is a glossy beetle of a deep chestnut color, marked with dotted lines. The family to which it belongs (*Nitidulidæ*) is a large one, the 800 species of which are widely distributed.

**Cadence** (kā'dens), the concluding notes of a musical composition or of any well-defined section of it. A cadence is *perfect*, *full*, or *authentic* when the last chord is the tonic preceded by the dominant; it is *imperfect* when the chord of the tonic precedes that of the dominant; it is *plagal* when the closing tonic chord is preceded by that of the subdominant; and it is *interrupted*, *false*, or *deceptive* when the bass rises a second, instead of falling a fifth. Cadence, or *cadenza*, is the name also given to a running passage which a performer may introduce at the close of a movement.

**Cadency** (kā'den-si), MARKS OF, in heraldry, marks intended to show the descent of a younger branch of a family from the main stock.

**Cadenza** (kä-den'zä). See *Cadence*.

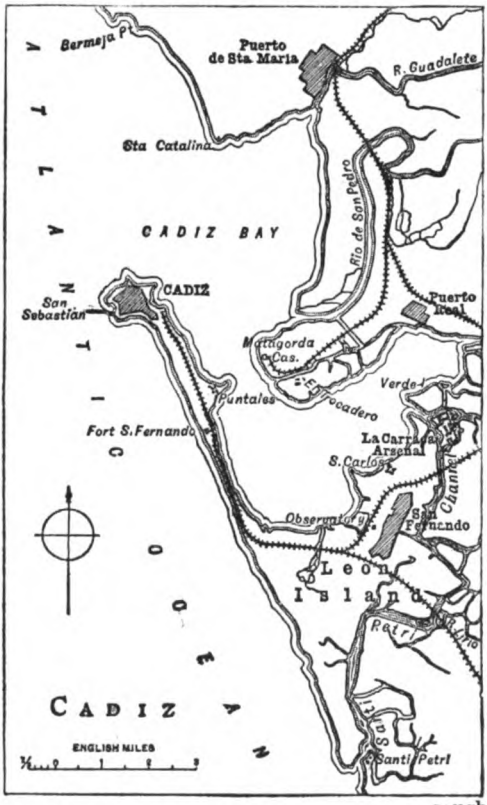
**Cadet** (ka-det'), a younger or youngest son; a junior male member of a noble family. Also the name or title given to a young man in training for the rank of an officer in the army or navy or in a military school. The term is French, but is used in Britain and the United States for youths in training for the army and navy. In the United States academies for cadets are at West Point, N. Y., and Annapolis, Md.

**Cadi,** or KADI, (kā'di), in Arabic, a judge or jurist. Among the Turks *cadi* signifies an inferior judge, in distinction from the mollah, or superior.

**Cadillac** (kad-il-lak'), a town, capital of Wexford Co., Michigan, 98 miles N. of Grand Rapids. It has extensive lumber mills, iron works, furniture factories, chemical plants, etc. It is a center of supply for the northern lumber district and a shipping point for farm produce. Pop. 9375.

**Cadiz** (kā'diz; Sp. pron. kä-dēth'; ancient *Gades*), a seaport of

Southwestern Spain, situated at the extremity of a long tongue of land projecting from the island of Leon, which is separated by a narrow (bridged) channel from the coast of Andalusia. It is well built, well paved, and very clean, and is strongly fortified. The chief buildings are the great hospital, the custom-house, the old and new cathedrals, the theaters, the bull-ring, capable of accommodating




12,000 spectators, and the lighthouse of St. Sebastian. The bay of Cadiz is a large basin inclosed by the mainland on one side and the projecting tongue of land on the other, with good anchorage, and protected by the neighboring hills. It has four forts, two of which form the defense of the grand arsenal, La Carraca (4 miles from Cadiz), has long been the principal Spanish naval station. Its trade is large, its exports being especially wine and fruit. Cadiz was founded by the Phœnicians about B.C. 1100, and was one of the chief seats of their commerce in the west of Europe. Pop. 67,174.—The province of Cadiz is the most southerly in Spain; area, 2809 sq. miles; pop. 452,659.

**Cadmium** (kad'mi-um), a rare metal which resembles tin in color and luster, but is a little harder. It is very ductile and malleable; has a specific gravity of 8.6 to 8.69; and fuses a little below a red heat. In its chemical character it resembles zinc. It occurs in the form of carbonate, as an ingredient in various kinds of calamine, or carbonate of zinc. It is also found in the form of a sulphide, as the rare mineral greenockite. It forms at least two oxides, one chloride, and one sulphide. Its symbol is Cd, its atomic weight 112.

**Cadmium Yellow,** a pigment prepared from the sulphide of cadmium. It is of an intense yellow color, and possesses much body.

**Cadmus** (kad'mus), in Greek legend, the son of Agenor and grandson of Poseidon (Neptune). He was said to have come from Phœnicia to Greece about 1550 B.C., and to have built the city of Cadmea or Thebes, in Bœotia. Herodotus and other writers ascribe the introduction of the Phœnician alphabet into Greece to Cadmus. The solar mythists identify him with the sun-god.

**Cadore** (kȧ-dō'rā), a small town of North Italy, 22 miles N. N. E. of Belluno, the native place of Titian, who was born here in 1477.

**Cadoudal** (kȧ-dö-dal), GEORGES, a royalist conspirator, born in Brittany in 1769, fought in the Vendean war in 1793. He was one of the Chouan chiefs who were defeated by Hoche in 1795 and 1796, and he instigated an unsuccessful revolt in 1799. Bonaparte sought to enlist him in his service, but he refused, and in 1803 went to Paris, having formed a plot with Pichegru to assassinate or dethrone the emperor. The plot being discovered, he was arrested in 1804, and executed with his accomplices.

**Cadre** (kä'dr), a list of the commissioned and non-commissioned officers of a regiment forming the staff; the nominal establishment of officers of a regiment.

**Caduceus** (ka-dū'sē-us), Mercury's rod; a winged rod entwisted by two serpents, borne by Mer-

cury as an ensign of quality and office. In modern times it is used as a symbol of commerce, Mercury being the god of commerce. The rod represents power; the serpents, wisdom; and the two wings, diligence and activity.

**Cæcilia** (sē-sil'i-a; L. *cæcus*, blind, from the minute size of their eyes), a genus of amphibians, formerly, on account of their external form ranked with the ophidian reptiles. They are entirely destitute of limbs, and the eyes are very small, and nearly hidden by the skin. They are usually 1 to 2 feet in length, but often much longer.

**Cæcum** (sē'kum), a blind process or sac in the alimentary canal of various animals. In fishes they are often numerous and long; and birds have generally two near the termination of the intestine. Mammals have commonly only one *cæcum*. In man the 'blind-gut' is small and situated at the beginning of the colon.

**Cædmon** (kad'mon), the first Anglo-Saxon of note who wrote in his own language, flourished about the end of the seventh century. He was originally a tenant, or perhaps only a cowherd, on the abbey lands at Whitby, but afterwards was received into the monastery. His chief work (if it can all be attributed to him) consists of paraphrases of portions of the Scriptures, in Anglo-Saxon verse, the first part of which bears striking resemblances to Milton's narrative in *Paradise Lost*.

**Caen** (kän), a town of France, in Normandy, the chief place in dep. Calvados, 125 m. northwest of Paris, and about 9 miles from the mouth of the Orne, which is here navigable. There is a dock connected with the sea by a canal as well as by the river. It is the center of an important trade, the market of a rich agricultural district, and carries on extensive manufactures. It is well built, with wide streets, and possesses many old buildings. One of the finest churches is that of St. Pierre, whose tower, terminated by a spire, is exceedingly elegant, and was built in 1308. Two other remarkable churches are St. Étienne or Church of the Abbaye-aux-Hommes, built by William the Conqueror, who was buried in it, and La Ste. Trinité or Church of the Abbaye-aux-Dames, founded by the Conqueror's wife. The buildings of the former *abbaye* are now used as a college, of the latter as a hospital. Other buildings are the castle and the *hôtel de ville*. There is a public library and a botanic garden. Lace is largely made here. Valuable building stone is quarried (see next article). Pop. (1906) 36,237.

**Caenstone,** the French equivalent for the Bath oolite of England, a cream-colored building-stone of excellent quality, got near Caen in Normandy. Winchester and Canterbury Cathedrals, Henry VII's Chapel at Westminster, and many churches are built of it.

**Caerleon** (kâr'lē-un), a small town in Monmouthshire, 26 miles from Bristol, on the river Usk. It was the site of the *Isca Silurum*, the chief Roman station in the country of the Silures, and Roman coins, statues, and sepulchral monuments are yet found. There are also the vestiges of an amphitheater. It is famous as one of the two traditional capitals of King Arthur's realm. Pop. 2046.

**Caermarthenshire.** See *Carmarthenshire*.

**Caernarvon.** See *Carnarvon*.

**Caernarvonshire.** See *Carnarvonshire*.

**Cæsalpinieæ** (sē-z-al-pin-i-e'ē), a subdivision of the natural order of plants Leguminosæ, containing several genera. The typical genus is Cæsalpinia, to which belong the Brazil wood, sapanwood, Nicaragua wood, etc. The Cæsalpinieæ include also among their number senna, the carob, tamarind, aloes-wood, logwood, etc.

**Cæsar** (sē'zâr), a title, originally a surname of the Julian family at Rome, which, after being dignified in the person of the dictator Caius Julius Cæsar, was adopted by the successive Roman emperors, and latterly came to be applied to the heir-presumptive to the throne. The title was perpetuated in the *Kaiser* of the Holy Roman and the modern German empires, and in the *Czar* of the Russian emperors.

**Cæsar,** CAIUS JULIUS, a great Roman general, statesman, and historian, was born B.C. 100; died B.C. 44. He was the son of the prætor Caius Julius Cæsar, and of Aurelia, a daughter of Aurelius Cotta. At the age of sixteen he lost his father, and shortly after he married Cornelia, the daughter of Lucius Cinna, the friend of Marius. This connection gave great offense to Sulla, the dictator, who proscribed him for refusing to put away his wife. His friends obtained his pardon with difficulty, and Cæsar withdrew from Rome, and went to Asia, serving his first campaign under M. Minucius Thermus, the prætor in Asia. On the death of Sulla Cæsar returned to Rome, where he distinguished

himself as an orator. He afterwards visited Rhodes, when he was taken by pirates, and compelled to pay fifty talents for his release. To revenge himself, he fitted out some vessels at Miletus, overtook the pirates, made the greater number of them prisoners, and had them crucified before Pergamus. He now returned to Rome, where his eloquence and liberality made him very popular. He was pontifex maximus in 63 B.C., and governor of Spain in 61 B.C. On his return to Rome, having united with Pompey and Crassus in the memorable coalition called 'the first triumvirate,' he became consul, and then obtained the government of Gaul with the command of four legions. His military career was

Julius Cæsar.—Marble in British Museum.

rapid and brilliant. He compelled the Helvetii, who had invaded Gaul, to return to their native country, subdued Ariovistus, who at the head of a German tribe had attempted to settle in the country of the Ædui, and conquered the Belgæ. In nine years he reduced all Gaul, crossed the Rhine twice (B.C. 55 and 53), and twice passed over to Britain, defeated the gallant natives of this island in several battles, and compelled them to give him hostages. The senate had continued his government in Gaul for another period of five years, while Pompey was to have the command of Spain, and Crassus that of Syria, Egypt, and Macedonia for five years also. But the death of Crassus in his campaign against the Parthians dissolved the triumvirate; and about the same time the friendship between Cæsar and Pompey cooled. The senate, influenced by Pompey, ordered that Cæsar should resign his offices and command within a certain time, or be proclaimed an enemy to the state, and appointed Pompey general of the army of the Republic. Upon this Cæsar urged his soldiers to defend the honor of their leader, passed the Rubicon (49 B.C.), and made himself master of Italy without striking a blow, Pompey retiring into Greece. Cæsar then levied an army with the treasures of the state, and hastened into Spain, which he reduced to submission without coming to a pitched battle with Pompey's generals. He next conquered Massilia (now Marseilles), and returned to Rome, where he was appointed dictator. He then followed Pompey into Greece, and defeated him at Pharsalia, from which Pompey escaped only to be assassinated in Egypt. In Rome the senate and the people strove eagerly to gain the favor of the victor. They appointed him consul for five years, dictator for a year, and tribune of the people for life. When his dictatorship had expired he caused himself to be chosen consul again, and without changing the ancient forms of government, ruled with almost unlimited power. In 46 B.C. he crossed to Africa, defeated the Pompeians Scipio and Cato at Thaspus, and returning to Rome he was received with the most striking marks of honor. The term of his dictatorship was prolonged to ten years, the office of censor conferred on him alone; his person was declared inviolable and his statue placed beside that of Jupiter in the capitol. He soon after was honored with four several triumphs, made perpetual dictator, and received the title of *imperator* with full honors of sovereignty. In February, 44, he declined the diadem which Antony publicly offered him, and next morning his statues were decked with diadems. His glory, however, was short lived, for a conspiracy was set on foot by his enemy Cassius, and joined by many of his own friends, including M. Brutus; and, notwithstanding dark hints had been given to him of his danger, he attended a meeting of the senate on the 15th (ides) of March, 44 B.C., and fell beneath the daggers of the conspirators. Of his writings, we still possess the history of his wars with the Gauls and with Pompey. Cæsar has been marked as 'the foremost man of all this world,' being great as a statesman, a general, an orator, a historian, and an architect and engineer, and his assassination was brought about more by jealousy and envy than by real patriotism.

**Cæsarea** (sez-a-rē'a), the ancient name of many cities, such as: (1) CÆSAREA PHILIPPI in Palestine, north of the Sea of Galilee, rebuilt by Philip, tetrarch of Galilee, son of Herod the Great.—(2) CÆSAREA, on the shores of the Mediterranean, about 55 miles N. W. from Jerusalem, enlarged and beautified by Herod the Great, and named in

honor of Cæsar Augustus; the place where St. Paul was imprisoned two years (Acts, xxiii, xxv).—(3) The capital of Cappadocia in Asia Minor.

**Cæsarean Operation** (sē-zā'ri-an), a surgical operation, which consists in delivering a child by means of an incision made through the walls of the abdomen and womb: necessary when the obstacles to delivery are so great as to leave no other alternative. It is said to be so named because Julius Cæsar was brought into the world in this way.

**Cæsarion** (sē-zā'ri-on), son of Julius Cæsar and Cleopatra, put to death by order of Augustus.

**Cæsium** (sē'zi-um), a rare metal, first discovered by Bunsen and Kirchoff by spectrum analysis in 1860; symbol Cs, atomic weight 133. It is soft, and of a silver-white color. It is always found in connection with rubidium. It belongs to the same group of elements with lithium, sodium, potassium, and rubidium—viz., the group of alkali metals.

**Cæstus** (cēs'tus), the boxing-glove of the Grecian and Roman pugilists. It was loaded with metal to increase the weight of the blow.

**Cæsura** (sē-zū'ra; L., a cutting), in Latin verse the separation of the last syllable of any word from those which precede it, by making it part of the following foot. In English poetry it is equivalent to a pause.

**Caf,** or KAF, in Mohammedan mythology, a mountain which environs the whole earth as a hedge encloses a field. Its foundation is the stone Sakhral, which is an emerald, whose reflection gives the sky its tints.

**Caffa,** STRAIT OF. See *Yenikale.*

**Caffeine** (kaf'e-in, ka-fē'in), or THEINE, the active principle of tea and coffee, a slightly bitter, highly azotized alkaloidal substance, crystallizing in slender, silk-like needles, found in coffee-beans, tea-leaves, Paraguay tea, guarana, etc. Coffee contains from 0.8 to 3.6, and tea from 2 to 4 per cent. Doses of 2 to 10 grains induce violent nervous and vascular excitement.

**Caffraria.** See *Kaffraria.*

**Cagayan** (kä-gä-yän'), an island in the Philippine group which, together with Sibutu, was ceded by Spain to the United States, Nov. 7, 1900, for the sum of $100,000.

**Cagli** (käl'yē), a town of Central Italy, 13 m. s. of Urbino, with a cathedral which contains a great fresco by the father of Raphael, Giovanni Santi. Pop. 4628.

**Cagliari** (käl'yä-rē), the capital of the island of Sardinia, at the head of a fine bay on the south coast. It is the residence of the viceroy and of an archbishop, and the seat of a university. It has some manufactures, and is the chief emporium of all the Sardinian trade. Its spacious and safe harbor is defended by several forts. Pop. 48,098.

**Cagliari,** PAULO. See *Veronese, Paul.*

**Cagliostro** (käl-yos'trō), COUNT ALESSANDRO (real name *Giuseppe [Joseph] Balsamo*), a celebrated charlatan, born in 1743 at Palermo. He was the son of poor parents, and entered the order of the Brothers of Mercy, where he acquired the knowledge of the elements of chemistry and physic. He left or had to leave the order, and committed so many crimes in Palermo that he was obliged to abscond. He subsequently formed a connection with Lorenza Feliciana, whose beauty, ability, and want of principle made her a valuable accomplice to his frauds. With her he traveled through many countries, assuming other names besides that of Count Cagliostro, pretending to supernatural powers, and obtaining considerable sums from those who became his dupes. In England he established an order of what he called Egyptian Masonry, in which, as *grand kophta,* he pretended to reveal the secrets of futurity, and made many dupes among the higher classes. In Paris he was implicated in the affair of the diamond necklace, which caused so great a scandal in the reign of Louis XVI, and was imprisoned in the Bastille, but escaped by means of his matchless impudence. He afterwards visited England, but met with little success. In 1789 he visited Rome, where he busied himself about freemasonry; but being discovered, and committed to the Castle of St. Angelo, he was condemned by a decree of the pope to imprisonment for life as a freemason, an arch-heretic, and a very dangerous foe to religion. He died in prison in 1795.

**Cagots** (kä'gōz), a peculiar race of men inhabiting France, in the Western Pyrenees. In the middle ages they were believed to be cannibals and heretics, and treated with the greatest ignominy. Legally they are now on the level with other Frenchmen, but socially they are still regarded as degraded. The name is probably derived from the Armor. *cacouz,* leprous, the Cagots being supposed to be descended from lepers.

**Caher** (kā'ẽr), an inland town, Ireland, County Tipperary, on the Suir, about 10 miles W. by N. of Clonmel, with an old picturesque castle on the summit of a rock. Pop. 2469.

**Cahors** (kȧ-ōr), a town in Southern France, dep. Lot, on the river Lot, 60 miles north of Toulouse. Under the Romans it was adorned with a temple, theater, baths, an immense aqueduct, and forum, remains of which are still to be seen. Among the principal edifices are the cathedral, and an episcopal palace, now converted into the prefecture. It was the birthplace of Gambetta. Pop. 10,047.

**Caiaphas** (kā'e-fas), a Jew, was the high priest at the time when the crucifixion took place. He was deposed A.D. 35, and Jonathan, the son of Annas, appointed in his stead.

**Caicos,** CAYOS (kī'kōz, kī'ōz), or THE KEYS (Spanish *cayo*, a rock or islet), one of the island groups comprehended under the general name of the Bahamas, consisting of six islands besides some uninhabited rocks. The largest, called the Great Key, is about 30 miles long. The inhabitants are few in number, and mostly engaged in fishing and the preparation of salt. In 1873 the Turks Islands and the Caicos were united into a commissionership under the governor of Jamaica.

**Caillie** (kȧl or kȧ'ye), NICOLAS LOUIS DE LA, a celebrated French astronomer, born in Picardy in 1713. He studied under Cassini, and in 1739 engaged in the measurement of the meridian, finding that the degrees increased in length as the pole was approached. In 1751 he went, at government expense, to the Cape of Good Hope, where he made accurate observations of about 10,000 stars. He published *Principles of Astronomy*, *Fables of the Sun*, etc., and died in 1762.

**Caillié** (kȧ-yā), RENÉ, a French traveler, born in 1799. He sought Western Africa in 1817, learned the Arab language, and pretended to be a Mussulman. In 1827–28 he made a journey from Sierra Leone to Timbuctu, and thence across the Sahara to Morocco. For this he received a reward of 10,000 francs, paid by the French government. Died in 1838.

**Caiman,** or CAY'MAN (kā'man). See *Alligator*.

**Cain** (kān), the eldest son of Adam and Eve; the first murderer, who slew his brother Abel. For the Biblical history of Cain and his descendants see Gen., iv. vii. A Gnostic sect of the 2d century called *Cainites* held that Cain was the offspring of a superior power and Eve, and Abel of an inferior power—the Jewish God—and that the killing of Abel symbolized the defeat of the inferior by the superior power.

**Caine** (kān), THOMAS HENRY HALL, novelist, born at Runcorn, England, in 1853. He was trained as an architect, but turned to journalism and was for six years engaged on the *Liverpool Mercury*. His literary work began in 1882 in four volumes of poetry, criticism, etc., his first novel, *Shadow of a Crime*, appearing in 1885. He first won reputation by *The Deemster*, issued in 1887. Subsequent popular works were *The Bondsman*, *The Scapegoat*, *The Manxman*, and *The Christian*. Of these, *The Deemster*, *The Manxman*, and *The Christian* have been dramatized.

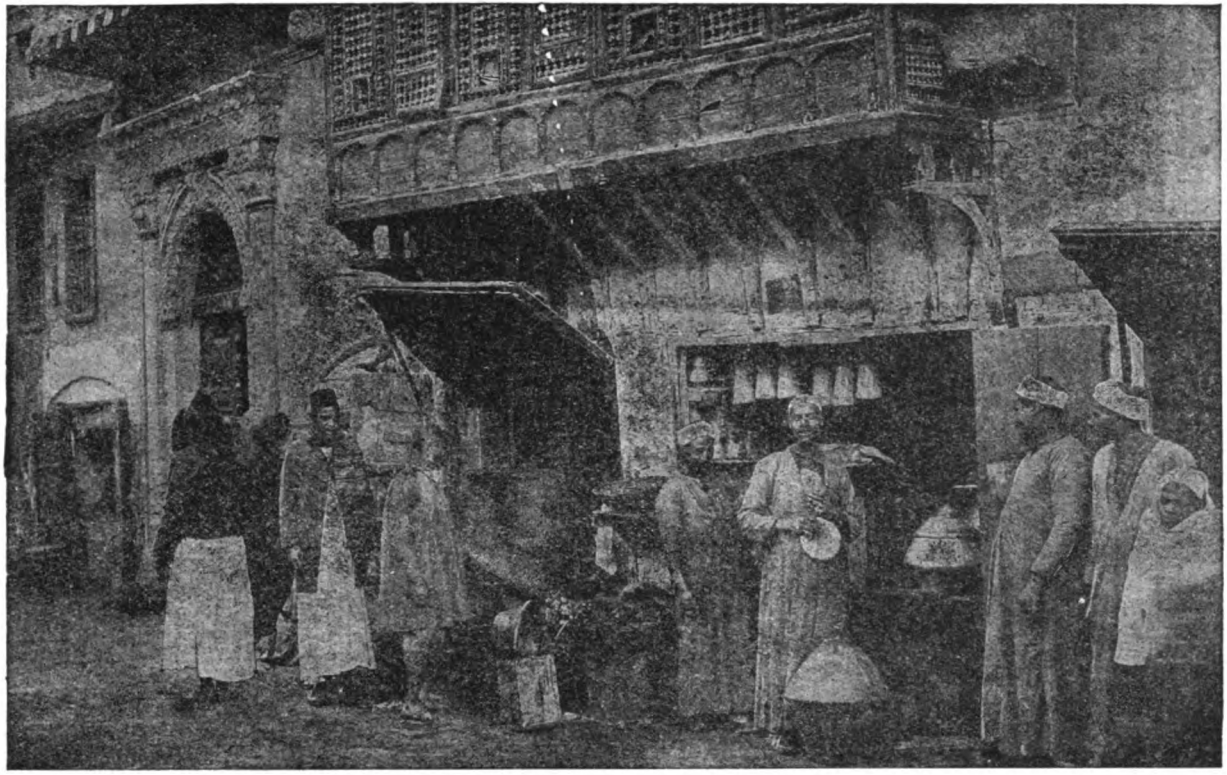
**Cainozoic** (kā-nō-zō'ik), a geological term (from Gr. *kainos*, recent, and *zōē*, life) applied to the latest of the three divisions into which strata have been arranged, with reference to the age of the fossils they include. The *Cainozoic* system embraces the tertiary and post-tertiary systems of British geologists, exhibiting recent forms of life, in contradistinction to the *Mesozoic*, exhibiting intermediate, and the *Palæozoic*, ancient and extinct, forms. It corresponds nearly with what has been called the age of mammals. Written also *Cænozoic*, *Kainozoic*.

**Caique** (kȧ-ēk'), a small skiff or rowing boat; especially a light skiff used in the Bosporus, where it almost monopolizes the boat traffic. It may have from one to ten or twelve rowers. The name is also given to a Levantine vessel of a larger size.

**Ca-ira** (sȧ-ē-rȧ; 'It [the revolution] shall go on'), the burden or refrain of a French revolutionary song of 1790. The air was a favorite one with Marie Antoinette.

**Caird** (kārd), JOHN, a Scottish divine, born in 1820; died in 1898; professor of divinity in Glasgow University 1862, principal of the university after 1873. He published sermons (*The Religion of Common Life* being the best known), and an *Introduction to the Philosophy of Religion*. His brother EDWARD was professor of moral philosophy at Glasgow after 1866, and published *Account of the Philosophy of Kant*; the *Social Philosophy and Religion of Comte*, and a book on Hegel.

**Cairn** (kārn), a heap of stones; especially one of those large heaps of stones common in Great Britain, particularly in Scotland and Wales, and



**A STREET SCENE IN CAIRO, EGYPT**
This picture shows the wonderfully carved balconies and doorways, and costumes of the natives.

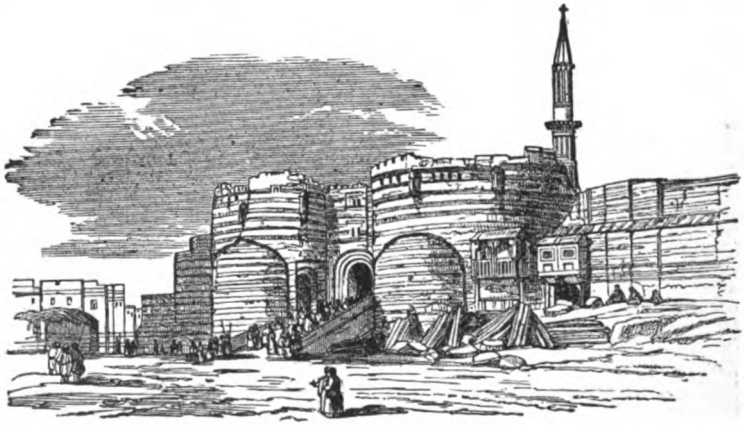
generally of a conical form. They are of various sizes, and were probably constructed for different objects. Some are evidently sepulchral, containing urns, stone chests, bones, etc. Some were erected to commemorate some great event, others appear to have been intended for religious rites, while the modern cairn is generally set up as a landmark.

**Cairnes** (kernz), JOHN ELLIOT, political economist, born at Drogheda in 1824; died in 1875. He was successively professor of political economy in Dublin, Galway, and London. Chief works, *Character and Logical Method of Political Economy; Political Essays; Leading Principles of Political Economy*, etc.

**Cairngorm** (kârn-gorm'), a Scottish mountain forming one of a great group of the Grampians on the borders of Aberdeen, Banff and Inverness shires, and rising to the height of 4084 feet above sea-level. It is particularly celebrated for the brownish or yellowish quartz crystals found on it, called *cairngorms*. They are regular hexagonal crystals, with a pyramidal top, and are much used for brooches, seals, and other ornaments.

**Cairo** (kī'rō; Arab. *Kahira*, the Victorious; properly, *Musr el Kahira*, 'the victorious capital') the capital of modern Egypt, is situated on the right bank of the Nile, 12 miles above the apex of its delta, and 150 miles by rail from Alexandria. The character of the town is still mainly Arabic, though in modern times the European style in architecture and other matters has become more and more prevalent. The city is partly surrounded by a fortified wall, and is intersected by seven or eight great streets, from which run a labyrinth of narrow crooked streets and lanes. There are several large squares or places, the principal being the Ezbekiyeh. To the southeast of the town is the citadel, on the last spur of the Mokattam Hills, overlooking the city. It contains the fine mosque of Mohammed Ali, a well 270 feet deep called Joseph's Well, cut in the rock, the palace of the viceroy, etc. There are upwards of 400 mosques. The finest is that of Sultan Hassan. There are also some forty Christian churches, Jewish synagogues, etc. The tombs in the burying-grounds outside the city also deserve mention, especially those known as the tombs of the Caliphs. The trade of Cairo is large, and the bazaars and markets are numerous. Of these the Khan el Khalili, in the northeast of the town, consists of a series of covered streets and courts in which all kinds of Eastern merchandise are displayed in open stalls. Cairo has railway communication with Alexandria, Suez, and Siout. Pop. (1910) 704,836.

**Cairo** (kā'rō), a river-port, capital of Alexander Co., Illinois, at the junction of the Ohio and Mississippi. It has large lumber interests and a variety of manufactures. Its facilities for transportation by river and rail are good, and it ships largely of grain, flour, oil and other products. Pop. 14,548.



Gateway of the Citadel, Cairo.

**Caisson** (kā'son). In civil engineering (1) a vessel in the form of a boat used as a floodgate in docks. (2) An apparatus on which vessels may be raised and floated; especially a kind

of floating-dock, which may be sunk and floated under a vessel's keel, used for docking vessels while at their moorings, without removing stores or masts. (3) A water-tight box or casing used in founding and building structures in water too deep for the coffer-dam, such as piers of bridges, quays, etc., also for excavating and building on land beside other buildings with foundations of less depth.

**Caithness** (kāth'nes), a county occupying the extreme north-east of the mainland of Scotland; area, 446,017 acres, of which about a fourth is under crop. The surface is generally moory and bare; it is watered by numerous small streams. The coast is rocky, and remarkable for bays and promontories. Fishing, together with the rearing of sheep and cattle, forms the principal employment of the inhabitants. Flagstones (Caithness flags) for pavement are extensively quarried. The towns are Wick, the county town, and Thurso. Pop. 33,860.

**Caius** (kēz), KEY or KAYE, JOHN, an English physician, born at Norwich in 1510; died in 1573. He was successively first physician to Edward VI, Mary, and Elizabeth. Having obtained permission to erect Gonville Hall, at Cambridge, into the college which still bears his name (Gonville and Caius College), he accepted the mastership and retired from public life, when he appears to have assiduously devoted himself to literary labors connected with his profession.

**Caivano** (kī-vä'nō), a town of S. Italy, about 9 m. north of Naples. Pop. 11,460.

**Cajamarca** (kä-ĥä-mär'kä). See *Caxamarca*.

**Cajeput** (kaj'e-put), or CAJUPUT, the name of several species of trees, genus *Melaleuca*, order Myrtaceæ, natives of the East Indies and Australia. See next article.

**Cajeput Oil,** the volatile oil obtained from the leaves of the cajeput-tree (*Melaleuca cajuputi*), a native of the Indian Archipelago, and some parts of Australia, or from others of the same genus. It is used in medicine as a carminative, stimulant, sudorific, and antispasmodic; also externally in chronic rheumatism and in myalgia.

**Cajetan** (ka'ye-tan), THOMAS DA VIO, CARDINAL, born in 1469; died in 1534; takes his name of Cajetan from the Italian town of Gaeta, in which he was born. When only fifteen years of age he became a Dominican monk, and in 1508 general of his order. In 1517 he was made a cardinal by Leo X, who, in the following year, sent him as his legate into Germany, the principal object of his mission being to endeavor to bring Luther back to the old faith. He was author of a *Commentary on the Bible;* a *Commentary on the Summa of Thomas Aquinas;* a *Treatise on the Authority of the Pope,* etc.

**Caj'uput.** Same as *Cajeput.*

**Calaba-oil** (kal'a-ba), an excellent illuminating oil obtained from *calaba-nuts,* the seeds of *Calophyllum calaba,* a tree that flourishes in Brazil and the W. Indies.

**Calabar** (kal'a-bar), the name of two rivers of western equatorial Africa, Old Calabar and New Calabar, which empty into the Gulf of Biafra, the latter a delta arm of the Niger. The name Calabar was formerly given to a tract of territory between the Benin and Old Calabar Rivers, corresponding largely to the old Niger Coast Protectorate, the capital of which was Old Calabar, or Duketown. The people of the district, which is chiefly embraced in the Niger delta, are largely employed in the palm-oil trade.

**Calabar Bean,** the seed of *Physostigma venenōsum,* a leguminous African plant, nearly allied to the kidney-bean. It is a powerful narcotic poison, operating also as a purgative and emetic, and in virtue of these last qualities is the famous 'ordeal bean' of Africa, administered to persons suspected of witchcraft. If it causes purging it indicates crime; if vomiting, innocence. It induces fainting fits and asphyxia, and weakens or paralyzes the action of the heart. It is employed in medicine, chiefly (externally) as an agent for producing contraction of the pupil of the eye in certain cases; sometimes also (internally) in neuralgia, intestinal atony, tetanus, and rheumatism.

**Calabash** (kal'a-bash), a vessel made of a dried gourdshell or of a calabash shell, used in some parts of America and Africa. They are so close-grained and hard that when they contain any liquid they may be put several times on the fire as kettles.

**Calabash-tree,** the popular name of the American trees or shrubs belonging to the genus *Crescentia,* given to them because of their large gourdlike fruits, the hard shells of which are made into numerous domestic utensils, as basins, cups, spoons, bottles, etc. The name is also given to *Adansonia digitāta,* the baobab of Africa.

**Calabozo** (ka-la-bō'thō), a town of Venezuela, in a plain be-

tween the rivers Guarico and Urituco. The neighboring ponds abound in electrical eels. Pop. 6000.

**Cala'bria,** a name anciently given to the peninsula at the southeastern extremity of Italy, but now applied to the S. W. peninsula in which Italy terminates, from about lat. 40° N. to the Strait of Messina; area 5819 square miles; pop. 1,370,208. It is divided into three provinces—Cosenza, Reggio, and Catanzaro. The central region is occupied by the great Apennine ridge, to which whole colonies with their cattle migrate in the summer. The flats near the coast are marshy and unhealthy, but the valleys at the foot of the mountains are rich with the most luxuriant vegetation. The country is subject to earthquakes. Wheat, rice, saffron, anise, liquorice, madder, flax, hemp, olives, almonds, and cotton are raised in abundance. The sugar-cane also comes to perfection here. Sheep, horned cattle, and horses are numerous. Silkworms are extensively raised. The minerals include alabaster, marble, gypsum, alum, chalk, rock-salt, lapis-lazuli, etc. The fisheries are valuable.

**Caladium** (kā-lā'di-um), a genus of plants, order Araceæ, natives of tropical South America, often cultivated in hothouses on account of their large finely colored leaves.

**Calahorra** (kā-lā-or'rā; anc. *Calagurris*), a town of Spain, near the S. side of the Ebro, province of Logroño. Birthplace of Quintilian. Wine, grain, oil, and flax are produced in the neighborhood. Pop. 9475.

**Calais** (kā-lā), a fortified seaport town of France, dep. Pas-de-Calais, on the Strait of and 25 miles S. E. of Dover; distant 184 miles by rail from Paris. The Old Town or Calais proper has a citadel, and was till recently surrounded by fortifications; but the modern suburb of St. Pierre de Calais having been amalgamated with Calais proper, both are now surrounded with forts and other works, to which morasses lend additional strength. Extensive harbor improvements have recently been carried out. Calais has considerable exports of grain, wine and spirits, eggs, fruit and vegetables; but the town derives its principal importance from its being the chief landing-place for English and other travelers to the continent. It has important manufactures of cotton and silk bobbin-net lace. In 1347 Calais was taken by Edward III of England, after a siege of eleven months. In 1558 it was retaken by the Duke of Guise, being the last relic of the French dominions of the Plantagenets, which at one time comprehended the half of France. Pop. 72,322.

**Calais** (kal'is), a sub-port of entry of Washington Co., Maine, at the head of navigation on the river St. Croix. It is a center of the lumber trade, and has various manufactures. Pop. 6116.

**Calais,** STRAITS OF. See *Dover, Straits of.*

**Calaite** (ka-lā'It), a name for turquoise.

**Calamanco** (kal-a-mang'kō), a glossy woolen stuff checkered in the warp, and either ribbed or plain.

**Calamander Wood** (kal-a-man'dėr; supposed to be a corruption of *Coromandel wood*), a beautiful species of wood, the product of *Diospyros quæsita*, nat. order Ebenaceæ, a native of Ceylon. It resembles rosewood, but is so hard that it is worked with great difficulty. It takes a very high polish, and is wrought into chairs and tables, and yields veneers of almost unequaled beauty.

**Calamary** (kal'a-ma-ri), the general name for two-gilled decapod cuttle-fishes of the family Teuthidæ, but properly used to designate those of the genus *Loligo*. The body is oblong, soft, fleshy, tapering, and flanked behind by two triangular fins, and contains a pen-shaped gladius or internal horny flexible shell. They have the power of discharging, when alarmed or pursued, a black fluid from an ink-bag. The species are found in all seas, and furnish food to dolphins, whales, etc. Some species can dash out of the water and propel themselves through the air 80 or 100 yards. *Loligo vulgāris* occasionally grows to the length of 2½ feet. Called also *Squid.*

**Calambac** (kal'am-bak), a fragrant wood, same as *Agila* or *Agallochum.*

**Calamianes** (kal-a-mi-ā'nez), a cluster of islands in the Indian Sea, among the Philippines, midway between Mindoro and Palawan. One of them is 36 miles long and 17 miles broad.

**Calamine** (kal'a-min), zinc carbonate. See *Zinc.*

**Calamint** (kal'a-mint), a plant of the genus *Calamintha*, nat. order Labiatæ. The plants are herbs or shrubs with dense whorls of purple-white or yellow flowers, with a two-lipped corolla and four conniving stamens. Some species are known respectively by the names of mountain-balm, catmint, basil-balm, and wild-basil. The first, also termed common calamint (*C. officinālis*),

has aromatic leaves, employed to make a variety of herb-tea.

**Calamite** (kal'a-mīt; *Calamites*), a genus of fossil plants, very characteristic of the carboniferous rocks. They had the habit of the modern equisetums, to which they are closely allied, but they were arborescent, with woody stems, true leaves, and corms with fruit scales like equisetum, but protected externally with bract leaves.

**Calamus** (kal'a-mus), a genus of palms, the stems of the different species of which are the rattan-canes of commerce. The genus holds a middle station between the grasses and palms, with the habit of the former and the inflorescence of the latter. The species are principally found in the hotter parts of the East Indies.

**Calamus,** in Scripture, the word used to translate a Hebrew term which is believed to mean an aromatic substance obtained from some kind of reed or cane, probably *Andropōgon Schœnanthus* or *A. calamus aromaticus* (sweet-scented lemon-grass). The name is also given to the root of the sweet-flag or sweet rush (*Acŏrus calamus*). See *Sweet-flag.*

**Calamy** (kal'a-mi), EDMUND, a Presbyterian divine, born in London in 1600; died in 1666. He engaged warmly in the religious disputes of the day, and was one of the writers of the famous treatise against Episcopacy, entitled *Smectymnuus*, a title furnished from the initial letters of the authors' names.—His son, BENJAMIN CALAMY, became an Episcopal clergyman, and distinguished himself by the publication of *A Discourse about a Scrupulous Conscience*, 1683.—The nephew of Benjamin, EDMUND CALAMY, born in 1671, died in 1732; has a place in literature as the biographer of Nonconformity. He published an abridgment of Baxter's *History of his Life and Times*, with a continuation; the *Life of Increase Mather*, etc.

**Calas** (kä-lä), JEAN, a memorable victim of fanaticism, born 1698; executed 1762. He was a Protestant, and was engaged as a merchant in Toulouse, when his eldest son committed suicide; and as he was known to be attached to the Roman Catholic faith, a cry arose that he had on that account been murdered by his father. Jean Calas and his whole family were arrested, and a prosecution instituted against him, in support of which numerous witnesses came forward. The parliament of Toulouse condemned him, by eight voices against five, to be tortured and then broken on the wheel, which sentence was carried out, his property being also confiscated. Voltaire became acquainted with his family, and procured a revision of the trial, when Calas was declared innocent, and his widow pensioned.

**Calatafimi** (ka-lä-ta-fē'mi), a town, of Sicily near its western extremity, with a ruinous Saracenic castle. Near it is the scene of Garibaldi's first victory over the Neapolitans in 1860. Pop. 11,426.

**Calatayud** (ka-lä-ta-yŏth'), a town of Spain, in the province of Saragossa, on the Jalon. There are mineral springs in the vicinity. Manufactures: linen and hempen fabrics, ropes, soap, paper, etc. The poet Martial was born here. Pop. 11,526.

**Calatrava** (käl-a-trä'va), anciently a famous fortress of Spain, on the Guadiana, not far from Ciudad-Real. It gave its name to a Spanish order of chivalry founded by Sancho III in connection with the defense of the place against the Moors, 1158. For a long period the war with the Moors was carried on mainly by the knights of Calatrava, who acquired great riches. In 1808 their possessions were confiscated, and the order became a simple order of merit.

**Calcareous** (kal-kā'rē-us), a term applied to substances partaking of the nature of lime or containing quantities of lime. Thus we speak of calcareous waters, calcareous rocks, calcareous soils.—*Calcareous spar*, crystallized carbonate of lime. This is found crystallized in more than 700 different shapes, all having for their primitive form an obtuse rhomboid. The rarest and most beautiful crystals are found in Derbyshire.—*Calcareous tufa*, an alluvial deposit of carbonate of lime, formed generally by springs, which, issuing through limestone strata, hold in solution a portion of calcareous earth; this they deposit on coming in contact with air and light. Calc-sinter is a variety of it.

**Calceolaria** (kal-sē-ō-lā'ri-a); L. *calceŏlus*, a slipper, from the shape of the inflated corolla resembling a shoe or slipper), slipperwort, a genus of ornamental herbaceous or shrubby plants, nat. order Scrophulariaceæ. All the species are South American; extensively cultivated in gardens. Most of

Calceolaria.

them have yellow flowers, some have puce-colored ones, and some occur with the two colors intermixed, while some are white. The greater number in cultivation are hybrids and not true species.

**Calcination** (k a l-s i-n ā'sh u n), the operation of roasting a substance or subjecting it to heat, generally with the purpose of driving off some volatile ingredient, and so rendering the substance suitable for further operations. The term was formerly also applied to the operation of converting a metal into an oxide or metallic calx; now called *oxidation*.

**Calcite** (kal'sīt), a term applied to various minerals all of which are modifications of the rhombohedral form of carbonate of calcium. It includes limestone, all the white and most of the colored marbles, chalk, Iceland-spar, etc.

**Calcium** (kal'si-um), the metallic base of lime; in the metallic state, one of the rarest of substances; combined, one of the most abundant and most widely distributed. As phosphate, it forms the main part of the mineral matter of the bones of animals; as carbonate, chalk, limestone, or marble, it forms mountain ranges; as sulphate of gypsum, large deposits in various geological formations; it is a constituent of many minerals, as fluorspar, Iceland-spar, etc., and is found in all soils, in the ash of plants, dissolved in seawater, and in springs, both common and mineral. It was first obtained in the metallic state by Sir H. Davy in 1808. When quite pure, it is a pale-yellow metal, with a high luster. It is about one and a half times as heavy as water, ductile, malleable, and very easily oxidized. Its salts are, for the most part, insoluble or sparingly soluble in water, but dissolve in dilute acids. Symbol Ca; atomic weight 40.

**Calc-sinter** (kalk-sin'tėr), a carbonate of lime, the substance which forms the stalactites and stalagmites that beautify many caves.

**Calculating Machines** (k a l-k ū-l ā t'i n g), machines or contrivances by which the results of arithmetical operations may be obtained mechanically. Various machines of this kind have been produced, but the only one much used is the invention of M. Thomas of Colmar (the arithmometer), which performs only addition and subtraction along with multiplication and division. The more complicated ones invented for more difficult operations by Babbage were never completed.

**Calculus** (kal'kū-lus), the INFINITESIMAL or TRANSCENDENTAL ANALYSIS, a branch of mathematical science. The lower or common analysis contains the rules necessary to calculate quantities of any definite magnitude whatever. But quantities are sometimes considered as varying in magnitude, or as having arrived at a given state of magnitude by successive variations. This gives rise to the higher analysis, which is of the greatest use in the physico-mathematical sciences. Two objects are here proposed: First, to descend from quantities to their elements. The method of effecting this is called the *differential calculus*. Second, to ascend from the elements of quantities to the quantities themselves. This method is called the *integral calculus*. Both of these methods are included under the general name *infinitesimal* or *transcendental analysis*. Those quantities which retain the same value are called *constant;* those whose values are varying are called *variable*. When variable quantities are so connected that the value of one of them is determined by the value ascribed to the others, that variable quantity is said to be a *function* of the others. A quantity is *infinitely great* or *infinitely small*, with regard to another, when it is not possible to assign any quantity sufficiently large or sufficiently small to express the ratio of the two. When we consider a variable quantity as increasing by infinitely small degrees, if we wish to know the value of those increments, the most natural mode is to determine the value of this quantity for any given period, as a second of time, and the value of the same for the period immediately following. This difference is called the *differential* of the quantity. The *integral calculus*, as has been already stated, is the reverse of the *differential calculus*. There is no variable quantity expressed algebraically of which we cannot find the differential, but there are differential quantities which we cannot integrate: some because they could not have resulted from *differentiation;* others because means have not yet been discovered of integrating them. Newton was the first discoverer of the principles of the infinitesimal calculus, having pointed them out in a treatise written before 1669, but not published till many years after. Leibnitz, meanwhile, made the same discovery, and published it before Newton, with a much better notation, which is now universally adopted.

**Calculus,** in pathology, a general term for the various inorganic concretions which are sometimes formed in the body. Such are *biliary calculi* or gallstones, formed in the gallbladder; *urinary calculi*, formed by a morbid deposition from the urine in the kidney

or bladder; and various others known as *salivary, arthritic, pancreatic, lachrymal,* etc. Urinary and biliary calculi are the most common. The former, when the particles are comparatively small in size, are known as *gravel,* when larger as *stone.* Either cause painful and dangerous symptoms. Stone in the bladder is often operated on by means of lithotomy or lithotrity (which see).

**Calcutta** (kal-kut'a; *Kâli Ghattah,* the ghaut or landing-place of the goddess Kâli), a city of British India and of Bengal; situated about 80 miles from the sea, on the left bank of the Hooghly (Hûgli), a branch of the Ganges, navigable up to the city for large vessels. The river opposite the city varies in breadth from about two furlongs to three-quarters of a mile. The city extends along the bank for about four miles and a half, and with a breadth of about a mile and a half, the entire site of Calcutta proper being about 8 sq. miles. Adjacent to the city itself, however, are extensive suburbs, which include the large town of Howrah on the opposite side of the Hooghly, connected with Calcutta by a pontoon bridge. The houses of the south or British quarter of Calcutta are of brick, elegantly built, and many of them like palaces, in striking contrast with the northern quarter occupied by the natives, the *Pettah* or *black town,* which has narrow, crooked, and ill-built streets. The city is encompassed by a spacious way called the Circular Road. On the west side is an extensive quay about 2 miles long, called the Strand. Outside the city, between the river and the fashionable quarter, lies Fort William, a magnificent octagonal work, which cost altogether £2,000,000 sterling, mounts over 600 guns, contains 80,000 stand of arms, and will hold 15,000 men. The plain between Fort William and the city forms a favorite promenade. At the north side, called the Esplanade, stands the government house, or palace of the governor-general, built by the Marquis Wellesley, at an expense of £1,000,000 sterling. Other edifices worth notice are the town-hall, supreme court, government treasury, writers' buildings, Metcalfe Hall, mint, theater, medical college, general post-office, general hospital, the new cathedral, the old cathedral. A tolerably good supply of filtered water from the Hooghly is furnished to the inhabitants; and a complete system of drainage has been constructed. Calcutta has an extensive system of internal navigation through the numerous arms and tributaries of the Ganges, and it almost monopolizes the external commerce of Bengal. There is a railway from Calcutta to Delhi, with branches to Ranigunge, Agra, etc., and through Allahabad to Bombay. Another line extends to Dacca. There is telegraphic communication with all parts of India, and with Europe. The principal exports are opium, cotton, rice, wheat, jute, gunny-bags, tea, indigo, seeds, raw silk, etc. Of the imports the most important in respect of value are cotton goods. Salt is a considerable import. The native shops are in bazaars in the narrow streets of the native town, the principal being the Burra, and the Old and New China Bazaars. The religious, educational, and benevolent institutions of Calcutta are numerous, the leading British, American, and European missions being represented. The educational institutions comprise the Presidency College, the Mohammedan College, and the Sanskrit College, all government colleges, besides others mainly supported by missionary efforts. There is a botanical garden belonging to the Asiatic Society on

Calcutta.—Bazaar on the Chitpore Road.

the beautiful island of Garden Reach, the summer residence of the rich British, and there are also extensive botanical gardens on the west bank of the river connected with the agricultural and horticultural societies. At the end of the 17th century Calcutta was only a cluster of three mud villages; in 1891 it contained, with its suburbs, a population of 861,764; in (1910) 1,009,008.

**Caldara** (kâl-dâ'râ), POLIDORO, called also *Caravaggio*, an Italian painter, born in 1495 at Caravaggio, in the Milanese. In his youth he carried bricks for the masons in the Vatican, and envying the artists at work there devoted himself to painting under the guidance of Maturino. He was afterwards employed by Raphael on the friezes of the Vatican. The oil painting of *Christ on the Way to Calvary* is his most noteworthy picture. In 1543 he was murdered by his domestic.

**Caldas** (kal'das; from L. *calidæ aquæ*, warm waters), a name of various places with warm springs in Spain, Portugal, and S. America.

**Caldecott** (kâ l'd e-kot), RANDOLPH, artist, born at Chester, England, in 1846. He entered a bank, but gave up banking for art. His first success was the publication, in 1875, of his illustrations of a volume of selections from Washington Irving's *Sketch-book*, under the title of *Old Christmas*. It was followed by his illustrations of *Bracebridge Hall* (1876), of Mrs. Carr's *North Italian Folk* (1877), of Blackburn's *Breton Folk* (1879), of *Æsop's Fables with Modern Instances* (1883). His most popular work, however, was the series of colored children's books commenced by him in 1878, and including *John Gilpin*, the *Elegy on the Death of a Mad Dog*, and the *Great Panjandrum*. He died at St. Augustine, Florida, in 1886.

**Caldera** (kâl-dâ'râ), a seaport, Chile, 50 miles N. W. of Copiapó, an outlet for the produce of the copper mines in the interior. Pop. 1878.

**Calderon** (kâl-de-ron') DE LA BARCA, DON PEDRO, a great Spanish dramatist, born at Madrid, in 1600; educated in the Jesuits' College, Madrid, and at Salamanca. Before his fourteenth year he had written his third play. Leaving Salamanca in 1625, he entered the army and served with distinction for ten years in Milan and the Netherlands. In 1636 he was recalled by Philip IV, who gave him the direction of the court entertainments. The next year he was made knight of the order of Santiago, and he served in 1640 in the campaign in Catalonia. In 1651 he entered the clerical profession, and in 1653 obtained a chaplain's office in the archiepiscopal church at Toledo. But as this situation removed him too far from court, he received, in 1663, another at the king's court chapel (being still allowed to hold the former); and at the same time a pension was assigned him from the Sicilian revenue. His fame greatly increased his income, as he was solicited by the principal cities of Spain to compose their *autos sacramentales*, for which he was liberally paid, and on which he specially prided himself. Besides heroic comedies and historical plays, some of which merit the name of tragedies, Calderon has left ninety-five *autos sacramentales*, 200 *loas* (preludes), and 100 *saynetes* (farces). He wrote his last play in the eightieth year of his age. His smaller poems are now forgotten; but his plays have maintained their place on the stage even more than those of Lope de Vega. Their number amounts to 128. He wrote, however, many more, some of which were never published. He died in 1681.

**Calderwood** (kâl'der-wụd), DAVID, a Scottish divine and ecclesiastical historian, born 1575, and in 1604 ordained minister of Crailing, Roxburghshire, where he distinguished himself by his opposition to the introduction of prelacy. In 1617 he was banished for contumacy, and went to Holland. In 1625 he returned to Scotland, and in 1640 became minister of the church of Pencaitland, near Edinburgh. He then engaged in writing the *History of the Church of Scotland*, a work published in 1842–49 by the Wodrow Society. He died in 1650.

**Caledonia** (kal-e-dō'ni-a), the name by which the northern portion of Scotland first became known to the Romans, when in the year 80 Agricola occupied the country up to the line of the Firths of Clyde and Forth. He defeated the Caledonians in 83, and again at Mons Grampius in 84, a battle of which a detailed description is given by Tacitus. In the early part of the 3d century they maintained a brave resistance to Severus, but the name then lost its historic importance. Caledonia is now used as a poetical name of Scotland.

**Caledonian Canal,** a waterway passing through Glenmore or the Great Glen of Scotland, and allowing vessels of 500 or 600 tons to sail from the Moray Firth to Loch Eil and the sea on the west. The distance from sea to sea being about 60 miles, of which only 22 consist of canal

proper. There are twenty-seven locks, the highest being about 95 feet above the sea.

**Calendar** (kal'en-dar, L. *calendarium*, from *calendæ*, the first day of the month), a record or marking out of time as systematically divided into years, months, weeks, and days. The periodical occurrence of certain natural phenomena gave rise to the first division of time, the division into weeks being the only purely arbitrary partition. The year of the ancient Egyptians was based on the changes of the seasons alone, without reference to the lunar month, and contained 365 days divided into twelve months of thirty days each, with five supplementary days at the end of the year. The Jewish year consisted of lunar months of which they reckoned twelve in the year, intercalating a thirteenth when necessary to maintain the correspondence of the particular months with the regular recurrence of the seasons. The Greeks in the earliest period also reckoned by lunar and intercalary months, but after one or two changes adopted the plan of Meton and Euctemon, who took account of the fact that in a period of nineteen years, the new moons return upon the same days of the year as before. This period of nineteen years was found, however, to be about six hours too long, and subsequent calculators still failed to make the beginning of the seasons return on the same fixed day of the year. Each month was divided into three decads. The Romans at first divided the year into ten months, but they early adopted the Greek method of lunar and intercalary months, making the lunar year consist of 354, and afterwards of 355 days, leaving ten or eleven days and a fraction to be supplied by the intercalary division. This arrangement continued till the time of Cæsar. The first day of the month was called the *calends*. In March, May, July, and October the 15th, in other months the 13th, was called the *ides*. The ninth day before the ides (reckoning inclusive) was called the *nones*, being therefore either the 7th or the 5th of the month. From the inaccuracy of the Roman method of reckoning, the calendar came to represent the vernal equinox nearly two months after the event, and at the request of Julius Cæsar, the Greek astronomer Sosigenes, with the assistance of Marcus Fabius, contrived the so-called *Julian calendar*. The chief improvement consisted in restoring the equinox to its proper place by inserting two months between November and December, so that the year 707 (B.C. 46), called the *year of confusion* contained fourteen months. In the number of days the Greek computation was adopted, which made it 365¼. To dispose of the quarter of a day it was determined to intercalate a day every fourth year between the 23d and 24th of February. This calendar continued in use among the Romans until the fall of the empire, and throughout Christendom till 1582.

By this time, owing to the cumulative error of eleven minutes, the vernal equinox really took place ten days earlier than its date in the calendar, and accordingly Pope Gregory XIII issued a brief abolishing the Julian calendar in all Catholic countries, and introducing in its stead the one now in use, the *Gregorian* or *reformed calendar*. In this way began the *new style*, as opposed to the other or *old style*. Ten days were to be dropped; every hundredth year, which by the old style was to have been a leap year, was now to be a common year, the fourth excepted; and the length of the solar year was taken to be 365 days, five hours, forty-nine minutes and twelve seconds the difference between which and subsequent observations is immaterial. The new calendar was adopted in Spain, Portugal, and France in 1582; in Catholic Switzerland, Germany and the Netherlands in 1583; in Poland in 1586; in Hungary in 1587; in Protestant Germany, Holland, and Denmark in 1700; in Switzerland in 1701; in England and its colonies in 1752; and in Sweden, 1753. In the English calendar of 1752, also, the 1st of January was now adopted as the beginning of the legal year, and it was customary for some time to give two dates for the period intervening between 1st January and 25th March, that of the old and that of the new year, as January 175 2/3. Russia alone retains the old style, which now differs twelve days from the new. Steps were taken in 1910 to abolish this discrepancy and bring the Russian calendar into conformity with that of the other nations.

In France, during the revolution, a new calendar was introduced by a decree of the National Convention, Nov. 24, 1793. The new reckoning was to commence on the autumnal equinox of 1792, which fell upon the 22d of September, when the first decree of the new republic had been promulgated. The year was made to consist of twelve months of three *decades* each, and, to complete the full number, five *fête* days, or *sansculottides* (in leap years six) were added to the end of the year. The seasons and months were as follows:—Autumn: 22d Sept. to 22d Dec.; *Vendémiaire*, vintage month; *Brumaire*, foggy month; *Frimaire*, sleet

month. Winter; 22d Dec. to 22d March: *Nivôse*, snowy month; *Pluviôse*, rainy month; *Ventôse*, windy month. Spring; 22d March to 22d June: *Germinal*, bud month; *Floréal*, flower month; *Prairial*, meadow month. Summer; 22d June to 22d Sept.: *Messidor*, harvest month; *Thermidor*, hot month; *Fructidor*, fruit month. The common Christian or Gregorian calendar was re-established in France on the 1st January, 1806, by Napoleon. For the Mohammedan calendar, see *Hejira*.

**Calender** (kal'en-dėr), a machine consisting of two or more cylinders (calenders) revolving so nearly in contact with each other that cloth or paper passed between them is smoothed and glazed by their pressure, or some other kind of finish is imparted to the surface.

**Calenders,** a sect of dervishes in Turkey and Persia. They preach in the market-places, and live upon alms. Their name is derived from their founder.

**Calends** (kal'endz; L. *calendæ*), the first day of the month among the Romans. See *Calendar.—The Greek calends*, a time that never occurred; an ancient Roman phrase which originated in the fact that the Greeks had nothing corresponding to the Roman calends.

**Calendula** (ka-len'dū-la), the marigold genus of plants.

**Calenture** (kal'en-tūr), a kind of delirium sometimes caused within the tropics, especially on board ship, by exposure to excessive heat. It is said that the sufferer imagines the sea to be a green field, in which he is tempted to walk by the coolness and freshness of its appearance.

**Calgary** (kal'ga-ri), a city of Alberta, Canada, on the Canadian Pacific and other railroads in the foothills of the Rocky Mountains at the junction of the Bow and Elbow Rivers. It contains railroad shops, flour mills, elevators, etc., and is the center of important agricultural, ranching and mining districts. Pop 83,000.

**Calhoun** (kal-hön') JOHN CALDWELL, statesman and orator, born in South Carolina in March, 1782. He was admitted to the bar of his state in 1807, and in 1811 was sent to Congress, where he distinguished himself by his eloquence. In 1817 he was made secretary of war under President Monroe; in 1824 he was elected vice-president of the United States, under John Quincy Adams, and again in 1828, under Jackson; in 1832 was elected a senator; in 1844 was appointed secretary of state by Tyler, and in 1845 became again a senator. He continued till his death an advocate of extreme state rights, and of the policy of the slave-holding states, the nullification movement in South Carolina in 1832 being largely due to him. He died March 31, 1850.

**Cali** (kä'lē), a town of Colombia, South America, state of Cauca. It has a good trade. Pop. about 16,000.

**Caliber** (kal'i-bėr), a technical term for the diameter of the bore of a firearm; also applied to inside diameters of other hollow apparatus.

**Calico** (kal'i-kō, from *Calicut* in India), a general term for any plain white cotton cloth; in America it is usually applied to printed cottons.

**Calico-printing** is the art of applying colors to cloth after it has come from the hand of the weaver in such a manner as to form patterns or figures. This art, originally brought from India, is sometimes practised on linen, woolen, and silk, but most frequently upon that species of cotton cloth called calico. The process was first introduced into Britain in 1676, and was originally accomplished by means of hand-blocks made of wood on which patterns or parts of patterns for each different color were cut. These blocks were of various dimensions, according to the nature of the work, and where several colors were employed in one pattern, a block for each color was necessary. As an improvement in the method of printing from wooden blocks, especially where delicacy of outline is required, engraved copperplates were introduced about 1760; but the greatest improvement was effected by the introduction of cylinder printing about 1785, this having almost superseded the other methods, except for particular styles. The machinery now generally used consists of various modifications of the cylinder printing-machine, in which a number of separate engraved cylinders are mounted, corresponding to the number of colors to be printed. Formerly the cloth had to pass once through the machine for every color; but now, by an arrangement of machinery equally ingenious and effective, any number of cylinders are fitted on one machine, which act on the cloth one after the other, and by this means the pattern is finished with a corresponding number of colors in the same time that was formerly employed to give one. A great variety of methods are employed in calico-printing, but they all fall under the general heads of *dye-colors* and *steam-colors*. Under the first head are included all the styles in which the pattern is printed on the cloth by a mordant—

a substance which may have little or no color itself, but has an affinity for the fiber, on the one hand, and for the coloring matter, on the other—the dye or coloring matter being subsequently fixed by dyeing on such parts of the cloth as have been impregnated with the mordant, and thus bringing out the pattern. In steam-color printing the coloring material is applied to the cloth direct from the printing-cylinder, and subsequently fixed by steaming. In steam-colors there is no limit to the number and variety of shades which may be produced, each color-box on the cylinder printing-machine containing all the ingredients essential to the production and fixation of a separate and distinct shade of color. This process is superseding most of the other styles, the brilliant coal-tar colors so extensively used being almost entirely fixed by steaming. The bodies used for fixing are tin mordants, tannic acid, etc., which are mixed with the dye-colors and printed together. The effects of calico-printing are varied by numerous other operations, such as the *discharge-style*, in which the cloth is first dyed all over, then printed in a certain pattern with discharge-chemicals, which either produce a pattern of some other color, or one purely white, as in the Turkey-red bandanna handkerchiefs. The *resist-style*, in some respects, is the reverse of the discharge-style; the process being to print a pattern in certain chemicals, which will enable those parts to resist the action of the dye subsequently applied to all other parts of the cloth. After the prints have undergone the printing process they are submitted to a series of finishing operations, the object of which is to give to the fabrics a pleasing appearance to the eye.

**Calicut** (kal'i-kut), a seaport of India, presidency of Madras, on the Malabar coast, which was ceded to the British in 1792. It was the first port in India visited by Europeans, the Portuguese adventurer, Pedro da Covilham having landed here about 1486, and Vasco da Gama in 1498. It has considerable trade, and manufactures cotton cloth, to which it has given the name *calico*. Pop. 76,981.

**Calif and Califate.** See *Caliph*.

**California** (ka-li-for'ni-a), one of the United States, bordering on the Pacific Ocean; area, 158,297 square miles. The coast extends the full length of the state, measuring about 700 miles, following the indentations. On the S. part of the coast are a few islands. The state may be divided into three distinct portions—the central being much the most densely populated. This central portion is embraced between the parallels 35° and 40°, and has on its E. side the Sierra Nevada, and on its W. the Coast Ranges. Between these two mountain chains lies the Great Central Valley of the Sacramento and San Joaquin, renowned for its beauty and fertility. It is this valley, which is about 450 miles in length by about 40 in breadth, to which the state now owes its principal wealth, and which has made it famous for its wheat, its wool, its fruits (including sub-tropical fruits in the S.), and the produce of its vineyards. N. of the parallel of 40°, where the Coast Ranges and the Sierra unite, the country is extremely rough and thinly inhabited. That portion of the state which lies to the S. and E. of the southern junction of the Coast Ranges and the Sierra is also thinly inhabited, with the exception of a narrow strip along the coast. The principal river is the Sacramento, which flows S. for upwards of 300 miles, receiving numerous affluents from the Sierra Nevada, and falls into the Bay of Suisun. The San Joaquin rises in the Sierra Nevada, flows N. for about 250 miles, and joins the Sacramento about 15 miles above Suisun Bay. It receives the waters of Lake Tulé or Tulares, and has numerous tributaries. The Bay of San Francisco, forming the most capacious harbor on the Pacific coast, is about 60 miles in length, 14 broad, and with a coast-line of 275 miles. It is connected with the ocean by a strait about 2 miles wide, and from 5 to 7 long, called the Golden Gate. The city of San Francisco stands on the N. W. shore of the southern arm.

The peaks of the Sierra Nevada—Mount Shasta, Lassen's Butte, Spanish Peak, Pyramid Peak, Mounts Dana, Lyell, Brewer, Tyndall, Whitney, and others—reach from 10,000 to nearly 15,000 feet above the sea (Mount Whitney is 14,886). The volcanic character of the state is manifested by the mountain formations; and earthquakes are frequent. California is celebrated for its many wonderful natural objects and remarkable scenery. Noteworthy are the Yosemite Valley (which see) and the 'big tree groves,' containing groups of mammoth trees—*Sequoia gigantea*—some of which reach the height of nearly 400 feet and an enormous girth.

The mineral resources of California are of great importance. Gold is found in abundance, the quantity obtained in 1910 being valued at over $21,000,000. It was first discovered in 1848, and brought a great rush of settlers to this part of the

world. Among other minerals found in the state are silver, quicksilver, copper, petroleum, salt and borax.

California, being intersected by the isothermal line of 60°, has the same mean annual temperature as the north of Spain and the center of Italy, and may, generally speaking, be esteemed genial and mild. The year may be divided into a dry and a wet season. On the lower slopes of the Sierra Nevada the climate is said to be that of constant spring. The most important farm crops are hay and forage, barley, winter wheat, beans, potatoes, sugar beets, oats, hops and corn. Fruits are most varied, including olives, grapes, apples, pears, plums, figs, oranges, peaches, cherries, apricots, almonds and grapefruit. The export of citrous fruits, dried fruits and pickled olives is very large. The cultivation of the vine is rapidly extending, and the production of wine and brandy and raisins is large and increasing. Irrigation is practised on nearly 50 per cent. of the cultivated land. The fisheries of California are prosperous, and stock and poultry raising are widely carried on. Manufactures, though still not among the principal industries, are rapidly on the increase, lumber and timber products, slaughtering and meat packing, and canning and preserving, in the lead. There is a large foreign trade, especially with the Orient.

California was ceded by Mexico to the United States in 1847, as a consequence of the Mexican War; in 1850 it was admitted into the Union. It possesses a number of educational institutions, chief among them the University of California, of which the famous Lick Observatory is a part, and the Leland Stanford Jr. University. The capital is Sacramento; the leading cities, San Francisco, Los Angeles and Oakland. Pop. (1910) 2,377,549.

**California,** GULF OF, a gulf on the w. coast of North America, in Mexico, lying between the peninsula of Lower California and the mainland. It is about 700 miles long, and, through most of its length, is less than 100 miles wide. It has long had a pearl fishery.

**California,** LOWER, a territory of Mexico, comprising a peninsula jutting into the Pacific Ocean, and separated from the mainland throughout its entire length by the Gulf of California. It is nearly 800 miles in length, and in different places 30, 60, 90, and 120 miles wide; area 61,562 sq. miles. It is largely mountainous and arid, but is said to possess valuable agricultural and mineral resources. The chief towns are Loretto and La Paz, the capital. Population 47,082, of whom perhaps a half are Indians.

**Caligula** (ka-lig'ū-la), CAIUS CÆSAR AUGUSTUS GERMANICUS, a Roman emperor, son of Germanicus and Agrippina, was born A.D. 12, in the camp at Antium; assassinated by conspirators A.D. 41. He received from the soldiers the surname of Caligula, on account of his wearing the *caligæ*, a kind of boots in use among them. He succeeded Tiberius, A.D. 37, and at first made himself very popular by his mildness and ostentatious

Caligula.

generosity; but at the end of eight months he was seized with a disorder, caused by his irregular mode of living, which appears to have permanently deranged his intellect. After his recovery, he suddenly showed himself the most cruel and unnatural of tyrants—a monster of debauchery and prodigality, a perpetrator of the greatest crimes and follies. The most exquisite tortures inflicted on the innocent served him for enjoyments. In the madness of his arrogance he even considered himself a god, and caused sacrifices to be offered to himself. One of his greatest follies was the building of a bridge between Baiæ and Puteoli (Puzzuoli), in order that he might be able to boast of marching over the sea on dry land. He projected expeditions to Gaul, Germany and Britain, and having reached the sea, he bade his soldiers gather shells for spoils, and then led them back to Rome. At last a band of conspirators put an end to his career in the 29th year of his age.

**Calipers** (kal'i-pers), compasses made either with arched legs to measure the diameters of cylinders or globular bodies, or with straight legs and retracted points to measure the interior diameter or bore of anything.

**Caliph,** CALIF, or KHALIF (kal'if, kā'lif; *vicegerent*) is the name assumed by the successors of Mo-

CALIFORNIA
Scale of Miles
0 10 20 40 60 80 100 120 140
Size of type indicates relative importance of places.
PART OF SOUTHEASTERN CALIFORNIA
Same Scale as Main Map
SACRAMENTO
San Francisco
Oakland
Stockton
San Jose
Santa Cruz
Monterey Bay
Fresno
Los Angeles
San Diego
Santa Barbara Channel
Outer Santa Barbara Channel
Gulf of Santa Catalina
Santa Barbara I.
Santa Catalina I.
San Nicolas I.
San Clemente I.
Santa Rosa I.
Santa Cruz I.
San Miguel I.
Pt. Conception
C. San Martin
Pt. Sur
Mt. Shasta
Mt. Dana
Mt. Lyell
Mt. Tyndall
Mt. Whitney
Owens L.
Tulare L.
Lassen Pk.
Eagle L.
Honey L.
Tahoe
Mono L.
Yosemite Valley
Sierra Madre
Los Olivos
Santa Barbara
Santa Ana
Riverside
Redlands
San Bernardino
San Bernardino Pk.
San Bernardino Mts.
Colorado R.
Colorado Valley
Death Valley
Mt. Whitney
Owens Pk.
Santa Rosa
Pacific Ocean
Pacific Ocean
Mexico
Longitude West from Greenwich
C.S. HAMMOND & CO., N.Y.

hammed in the government of the faithful and in the high-priesthood. *Caliphate* was therefore the name given to the empire of these princes which the Arabs founded in Asia, and enlarged, within a few centuries, to a dominion exceeding even the Roman empire in extent. The appellation of caliph has long ago been swallowed up in *Shah*, *Sultan*, *Emir*, and other titles peculiar to the East. Mohammed having died without naming his successor, three rival parties appeared immediately after his death. The first was headed by Omar, a kinsman of the prophet, who demanded the election of Abu Bekr, Mohammed's father-in-law. The second party was headed by Ali, the husband of Fatima, the prophet's daughter, who declared for himself. The third party consisted of people of Medina, who demanded the election of one of themselves. Abu Bekr was chosen (A.D. 632), and prosecuting the conquest of Syria, he defeated the Byzantine emperor Heraclius and took Damascus. His successor, Omar, completed the conquest of Syria, took Jerusalem, subjugated Egypt, and defeated the Persians. He is said to have erected over 1500 mosques. He was succeeded by Othman, or Osman, who completed the conquest of Persia and other Eastern countries, extended his dominion in Africa, and took Cyprus and Rhodes. Othman was succeeded by Ali, who is regarded as the first legitimate possessor of the dignity by a numerous sect of Mohammedans, which gives him and his son, Hassan, almost equal honor with the prophet. During his reign a great schism divided the Mohammedans into two sects called the Sunnites and the Shiites, the former acknowledging the authority of all the caliphs, the latter acknowledging only Ali and his descendants. Ali was murdered in A.D. 660, and his son Hassan in 661, when Moawiyah, the founder of the dynasty of the Ommiyades, became caliph, and transferred his capital from Medina to Damascus. His army continued the conquest of Northern Africa, and twice unsuccessfully attacked Constantinople. Carthage was taken in 698, after which the Mohammedans encountered no serious opposition in Northern Africa. From the union of the Arabic and Berber races of Africa sprung the Moors of Saracenic history. The conquest of Spain immediately followed, Tarik, the lieutenant of the Saracen general, Musa, having totally defeated the King of the Goths. The caliphate now extended from the Oxus and Indus to the Atlantic. In 732 a great host of Moslem soldiery crossed the Pyrenees and invaded France, but were totally defeated at Tours by Charles Martel. In 755 the Mohammedan dominion split up into the *Eastern* and *Western Caliphates*, the western caliph having Spain, with his capital at Cordova; and the eastern including Northern Africa, with the capital at Bagdad. The former was ruled by a series of Ommiyade caliphs; the latter by the dynasty of the Abbasides. The most celebrated of the Abbaside caliphs of Bagdad was Harun al Rashid (Aaron the Just), 786–808, under whom learning, science, and art were in a flourishing state. Subsequently the Moslem kingdom lost province after province, and the temporal authority of the Caliph of Bagdad was destroyed. Numerous independent dynasties were set up, the most important of which was that of the Fatimites, founded by an African Saracen who claimed descent from Fatima the daughter of the prophet. This dynasty conquered Sicily and several parts of Italy, Egypt, and Palestine. It came to an end in 1171. In 1031 the Western Caliphate ceased, and the Saracenic dominion in Spain was broken up into several small states. The most brilliant period of the Western Caliphate was in the 9th and 10th centuries, when literature, science, and art were in more flourishing condition than anywhere else in Europe. The Eastern Caliphate lingered on till 1258, when Bagdad was taken and sacked by the Mongols.

**Calisaya Bark** (kal-i-sū'ya), a variety of Peruvian or cinchona bark, namely, that of *Cinchōna calisāya* or *flava*.

**Calisthenics** (kal-is-then'iks), the art of exercising the body for the purpose of giving strength to the muscles and grace to the carriage. The term is usually applied to the physical exercises of women and girls, as gymnastics is to those of men and boys.

**Caliver** (kal'i-ver), an early form of hand-gun, musket, or arquebuse, lighter and shorter than the musket, which had the advantage of the latter in being fired without a rest, and much more rapidly. It seems to have gone out of fashion about 1630.

**Calixtines** (kal'iks-tīns), or UTRAQUISTS, a sect of Hussites in Bohemia, who published their confession in 1421, the leading article of which was a demand to partake of the cup (*calix*) as well as of the bread in the Lord's Supper, from which they received their name of *Utraquists* (L. *uterque*, both). Their tenets were conceded by the articles of Basel in 1433, and they became the predominant party

in Bohemia. The name Calixtine is also given to a follower of Georg Calixtus.

**Calixtus** (kal-liks'tus), the name of three popes.—CALIXTUS I was a Roman bishop from 217 to 224, when he suffered martyrdom.—CALIXTUS II was elected in 1119, in the monastery of Clugny, successor of the expelled pope, Gelasius II, who had been driven from Italy by the Emperor Henry V, and had died in this monastery. He excommunicated the Emperor Henry V on account of a dispute respecting the right of investiture; as also the antipope Gregory VIII, whom he drove from Rome. He availed himself of the troubles of the emperor to force him, in 1122, to agree to the Concordat of Worms. He died in 1124.—CALIXTUS III, chosen in 1168 in Rome, as antipope to Paschal III, and confirmed by the Emperor Frederick I, in 1178, was obliged to submit to Pope Alexander III. As he was not counted among the legal popes, a subsequent pope, ALFONSO BORGIA, made pope in 1455, was called *Calixtus III.* He died in 1458.

**Calixtus** (properly *Callisen*), GEORG, an able and enlightened German theologian of the Lutheran Church in the 17th century, was born in 1586 in Schleswig; died in 1656. In 1614 he became professor of theology in Helmstedt. He wrote against the celibacy of the clergy, and proposed a reunion of Catholics and Protestants upon the basis of the Apostles' creed.

**Call** (kąl), a term used in various senses; as, (1) in reference to joint-stock companies, and the like, a demand for payment of the whole or a portion of the amount which a person has undertaken to contribute to any scheme; (2) in Presbyterian churches, the written document signed by the members of a congregation calling on or inviting a clergyman to become their pastor, and presented to him after he has been duly elected.—*Call to the bar*, the formal admission of a person to the rank of barrister.

**Calla** (kal'la), a genus of plants, nat. order Orontiaceæ. The known species are few and of widely different habitats. *C. palustris* occurs in the north of Europe and America. It has a creeping root-stock extremely acrid in taste, but which, when deprived of its causticity by maceration and boiling, is made by the Lapps into bread. The beautiful *Richardia Æthiopica* (Ethiopian lily) was formerly included in this genus, and is still sometimes called *Calla Æthiopica.*

**Callao** (kal-yä'ō), a seaport town of Peru, the port of Lima, from which it is 6 miles distant, and with which it is connected by a railway; pop. 48,118. The roadstead is one of the best in the Pacific, and there is a dock, with an area of nearly 52 acres, constructed at a cost of $8,500,000, besides a floating iron dock. Callao is the emporium of the whole of the trade of Peru, importing manufactured goods, and exporting guano, copper ore, sodium nitrate, wool, bark, etc. It is the starting point of the famous Oroya railway. In 1746 the old town was destroyed by an earthquake, with much loss of life and damage to shipping.

**Callcott** (kal'kot), JOHN WALL, an eminent composer, born in London in 1766; died in 1821. He studied under Handel; obtained the Mus. Doc. degree from Oxford; was author of a musical grammar; and was especially noted for his glee compositions.—SIR AUGUSTUS WALL, brother of the above, born at Kensington, in 1779, died 1844. He studied portrait-painting under Hoppner, but distinguished himself specially in landscape-painting. In 1837 he was knighted, and in 1843 was appointed keeper of the royal collections of pictures.

**Callernish** (kal'ėr-nish), a village and district of Scotland, Isle of Lewis, 16 miles west of Stornoway, famous for its circles of standing stones. The main circle is 40 feet in diameter, formed of twelve unhewn blocks of gneiss from 10 to 13 feet high, with a larger block in the center. From this circle rows of stones project to the east, west, and south. There are upwards of 40 blocks altogether.

**Callichthys** (kal-ik'this), a genus of fishes belonging to the abdominal malacopterygians, and family Siluridæ or sheat-fishes. They are natives of hot climates, and are said to make their way over land in search of water during dry seasons.

**Calligonum** (kal-ig'o-num), a genus of shrubs belonging to the Polygonaceæ. The best-known species is *C. pallasia*, of the steppes near the Caspian, the acid fruit and shoots of which are often eaten to allay thirst.

**Callimachus** (kal-im'a-kus). 1. A Greek poet and grammarian, born at Cyrene, in Libya, of a noble family; flourished about 250 B.C. He taught at Alexandria, and was appointed by Ptolemy Philadelphus librarian of the Alexandrine Museum. He wrote an epic poem called *Galatea*, several prose works, and tragedies, elegies,

comedies, etc., but only some seventy-two epigrams and six hymns remain.—2. A Greek architect and artist who flourished about 400 B.C., the reputed originator of the Corinthian column.

**Call'inger.** See *Kalinjar.*

**Callinus** (kal-lī'nus), of Ephesus, the earliest Greek elegiac poet, flourished about 730 B.C. Only a few fragments of his elegies are extant.

**Calliope** (kal-ī'o-pē), one of the Muses. She presided over eloquence and heroic poetry and was the mother of Orpheus.

**Calliope,** an organ of pipes through which steam passes with great velocity, a tune being thus played by means of a keyboard attached thereto.

**Callisthenes** (kal-is'then-ēz), a Greek philosopher and historian, a native of Olynthus, who was appointed to attend Alexander in his expedition against Persia. His expressed disapprobation of the conduct of Alexander incurred the displeasure of the courtiers and royal favorites, and he was put to death on a pretended charge of treason, 328 B.C.

**Callosity** (kal-os'i-ti), any thickened or hardened part of the human skin caused by pressure and friction. Also the natural cutaneous thickenings on the buttocks of monkeys.

**Callot** (kål-ō), JACQUES, a French engraver, born about 1593; died in 1635. He distinguished himself in Italy and France, and was patronized by the Grand-duke of Tuscany and by Louis XIII. He preferred etching, probably because his active and fertile genius could in that way express itself more rapidly. In the space of twenty years he designed and executed about 1600 pieces, the characteristics of which are freedom, variety, and naïveté.

**Callu'na.** See *Heath.*

**Callus** (kal'us), a callosity; also a new growth of osseous matter between the extremities of fractured bones, serving to unite them.

**Calmar** (kal'mar), the principal city of a province of the same name in Sweden, is situated opposite to Oeland, on the island of Quarnholm, and has some manufactures and a good trade. It derives celebrity from the treaty of 1397, called the Union of Calmar, by which the three Scandinavian kingdoms, Denmark, Norway, and Sweden, were united under Margaret, hereditary Queen of Denmark, and widow of Hakon, King of Norway.

**Calmet** (kål-mā), AUGUSTINE, distinguished as an exegetical and historical writer, was born in Lorraine in 1672; died at Paris in 1757. He early entered the order of St. Benedict, and became the head of several abbeys in succession. He was an industrious compiler of voluminous works, such as *Commentaire sur tous les Livres de l'Ancien et du Nouveau Testament* (Paris, 1707–16), *Dictionnaire Historique et Critique de la Bible, Histoire Ecclésiastique et Civile de la Lorraine,* etc.

**Calms** (kâms), REGIONS OF, tracts in the Atlantic and Pacific Oceans, on the confines of the trade-winds, where calms of long duration prevail. About the winter solstice their average northern limit is in 5° N. lat., and in the months about the summer solstice about 12° N. lat. The southern limit lies nearly always to the north of the equator, varying between 1° and 3° N. lat.

**Calmucks.** See *Kalmucks.*

**Calne** (kăn), a municipal and, until 1885, a parliamentary borough in Wiltshire, England, 31 miles N. N. W. of Salisbury. It is the center of the manufacture of the far-famed Wiltshire bacon. Pop. of mun. borough, 3539.

**Calomel** (kal'o-mel), mercurous chloride, $Hg_2Cl_2$, a preparation of mercury much used in medicine, and also found native as horn-quicksilver. It is prepared by grinding in a mortar sulphate of mercury with as much mercury as it already contains, and heating the compound which is formed with common salt in a retort until the mercury sublimes. The calomel is thus produced as a tasteless white powder. It is used in a variety of ailments, as a purgative, a vermifuge, etc.

**Calonne** (kå-lon), CHARLES ALEXANDRE DE, a French statesman, born in 1734 at Douai; died at Paris in 1802. He studied at Paris, and devoted himself to the duties of an advocate. In 1783 he succeeded Maurepas as minister of finance; but after four years of incessant endeavors at financial reform he could do nothing but advise an assembly of the notables, which accordingly met in 1787. The financial statement which he then made led to his dismissal, and he retired to England. On the breaking out of the revolution he supported the royalist party with much zeal.

**Calophyllum** (ka-lō-fil'um), a genus of plants, nat. order Guttiferæ, consisting of large timber

trees, with shining leaves which have numerous transverse parallel veins. *C. Inophyllum* yields a medical resin, the tacamahac of the East Indies. The seeds afford an oil which is used for burning, for making ointment, etc.

**Calorescence** (k a l-ō-r e s'e n s), the transmutation of heat rays into light rays; a peculiar transmutation of the invisible calorific rays, observable beyond the red rays of the spectrum of solar and electric light, into visible luminous rays, by passing them through a solution of iodine in bisulphide of carbon, which intercepts the lu-

**Calorie** (Fr. from the Latin *calor*, heat), is one of several thermal units. The quantity of heat required to raise a grain of water 1° Centigrade is termed the *small calorie*. The amount of heat required to raise a kilogram of water 1° is a *large* or *great calorie*, or 1000 small calories. About 80 calories are required to change a gram of ice at 0° Centigrade to water at 0° C and 540 calories are required to change the same mass of water at 100° C to steam at 100° C.

**Calorimeter** (kal-ō-rim'e-tėr), an apparatus for measuring absolute quantities of heat or the specific or latent heat of bodies, as an instrument for measuring the heat given out by a body in cooling from the quantity of ice it melts or from the rise of temperature it produces in water around it.

**Calotropis** (ka-lot'ro-pis), a genus of shrubs or small trees, order Asclepiadaceæ, one species of which yields the Indian fiber called *mudar* (which see). For another species see *Apple of Sodom*.

**Calotte** (ka-lot'), a skullcap worn by ecclesiastics in Catholic countries, and in England by serjeants-at-law.

**Calot'tists,** or the REGIMENT DE LA CALOTTE, a society which sprang up at Paris in the last years of the reign of Louis XIV, and was named from the word *calotte* (*q. v.*) which was the symbol of the society. All were admitted whose ridiculous behavior, odd character, foolish opinions, etc., had exposed them to public criticism.

**Calotype** (kal'o-tīp), the name given to the process, invented by Talbot about 1840, of producing photographs by the action of light upon paper impregnated with nitrate of silver. See *Photography*.

**Caloyers** (ka-loi'ers; Gr. *kalos*, beautiful, good, *gerōn*, an old man), Greek monks belonging to the order of St. Basil, who lead a very austere life. Their most celebrated monastery in Asia is at Mount Sinai; in Europe at Mount Athos. They do not all agree as to their mode of life. Some of them are cenobites; that is, they live in common. Others are anchorites, living alone, or with only one or two companions; and others again are recluses, who live in grottoes or caverns in the greatest retirement, and are supported by alms supplied to them by the monasteries.

**Calpee,** KALPI (kal'pē), a town of British India, in the united provinces of Agra and Oudh, on the right bank of the Jumna, about 50 miles S. S. W. of Cawnpore. During the Sepoy mutiny Calpee became a principal rendezvous of the revolted Gwalior contingent, which was signally defeated, first by Sir Colin Campbell, in the vicinity of Cawnpore, and afterwards at Calpee itself by Sir Hugh Rose, May 26, 1858.

**Calpurnia** (kal-pur'ni-a), the fourth wife of Julius Cæsar, married to him 59 B.C. She was a daughter of L. Calpurnius Piso, who was consul in 58 B.C.

**Calpur'nius,** TITUS, a Latin pastoral poet, born in Sicily about the end of the 3d century. Eleven eclogues composed by him are extant.

**Caltabellota** (k ă l-t a-b e l-l o t'a), a town of Sicily, province of Girgenti. Pop. 6408.

**Caltagirone** (-jē-rō'nā), a town of Sicily, 34 m. S. W. of Catania: the see of a bishop. It is noted for the manufacture of terra-cotta figures and pottery. Pop. 35,116.

**Caltanissetta** (-ni-set'ta), a town, Sicily, capital of the province of the same name, on the right bank of the Salso, 62 miles S. E. of Palermo. In the vicinity are springs of petroleum and of hydrogen gas, a mud volcano, and important sulphur mines. Pop. 43,303.—The province has an area of 1263 square miles, with a pop. of 329,449.

**Caltha** (kal'tha), the genus of ranunculaceous plants to which the marsh-marigold (*C. palustris*) belongs.

**Caltrop** (kal'trop), a military instrument with four iron points, disposed in such a manner that three of them being on the ground the other points upward, formerly scattered on the ground to impede the progress of an enemy's cavalry.—Also the common name of *Centaurĕa calcitrāpa* (the star-thistle),

found in waste places in the south of England. The heads are covered with long, yellow spines. The water caltrop is *Trapa natans*, the fruit of which has several horns formed of the indurated lobes of the calyx.

**Calumba** (kâ-lum'ba), or COLOMBO, a plant, *Jateorhiza palmâta*, indigenous to the forests of Mozambique, nat. order Menispermaceæ. The large roots are much used as a bitter tonic in cases of indigestion. American or false calumba is the bitter root of *Frasēra Carolinensis*, a gentianaceous herb found in North America.

**Calumet** (kal'ū-met), a kind of pipe used by the American Indians for smoking tobacco. Its bowl is usually of soft red soapstone, and the tube a long reed, ornamented with feathers. The calumet is (or was) used as a symbol or instrument of peace and war. To accept the calumet is to agree to the terms of peace, and to refuse it is to reject them. The calumet of peace is used to seal or ratify contracts and alliances, to receive strangers kindly, and to travel with safety. The calumet of war, differently made, is used to proclaim war.

**Calvados** (kâl-vâ-dos), a French dep., part of the old province of Normandy, bounded on the N. by the English Channel, and E., W., and S. by the deps. Eure, La Manche, and Orne. Area, 2145 sq. m. It is named from a dangerous ridge of rocks which extends along the coast for 10 or 12 miles. The dep. is undulating and picturesque, and possesses rich pastures. Chief town, Caen. Pop. 403,431.

**Calvaert** (kâl-värt'), DIONYS, a painter, was born at Antwerp in 1555; died at Bologna in 1619. He went very young to Italy, and ultimately opened a school at Bologna, from which proceeded 137 masters, and among these Albano, Guido, and Domenichino.

**Calvary** (kal'va-ri), from L. *calvaria*, a skull, used in the Vulgate to translate the Hebrew *golgotha* (a skull), and applies to the place outside Jerusalem where Christ was crucified, usually identified with a small eminence on the north side of the city. The term is also applied in Roman Catholic countries to a kind of chapel, sometimes erected on a hill near a city and sometimes on the exterior of a church, as a place of devotion, in memory of the place where our Saviour suffered; as also to a rocky mound or hill on which three crosses are erected, an adjunct to religious houses.

**Calverley** (kal'ver-li), CHARLES STUART, poet and humorist, born at Martly, Worcestershire, in 1831; died in 1884; was educated at Oxford and Cambridge. He wrote little, but the poems in his *Verses and Translations* and *Fly Leaves* are very clever examples of humor and parody. He made a good translation of Theocritus.

**Calvert** (kal'vert), GEORGE, the first Baron Baltimore. See *Baltimore*.

**Calvi** (kal'vi), a fortified seaport of France, on the N.W. side of Corsica. It was taken by the English in 1794, but abandoned in the following year. Pop. (1906) 1967.

**Calvin** (kal'vin), JOHN (so called from *Calvinus*, the Latinized form of his family name, *Cauvin* or *Chauvin*), reformer and Protestant theological writer, born at Noyon, Picardy, in 1509; died at Geneva in 1564. His father, Gerard Cauvin, *procureur-fiscal* and diocesan secretary, dedicated him early to the church, and he was presented with a benefice at the age of twelve. The income derived from this nominal office enabled him to proceed to Paris and enter on a course of regular study. He was soon led to entertain doubts respecting the priesthood, and became dissatisfied with the teaching of the Roman Catholic Church; in consequence he gave up his cure, and took to the study of the law in Orleans. In 1532 he returned to Paris a decided convert to the reformed faith, and was soon compelled to fly, when, after various wanderings, he found a protector in Margaret of Navarre. In 1534 he returned to Paris; but, finding that the persecution against those who were inclined to the doctrines of the reformers was still raging, he retired to Basel in the autumn of the same year. At Basel he completed and published his great work, *The Institutes of the Christian Religion* (*Christianæ Religionis Institutio;* 1536). Having gone to Italy, after a short stay at Ferrara he went to Geneva, where reform had just been established. In 1538, in company with Farel, he was expelled from Geneva in consequence of the reign of extreme strictness they had introduced, when he went first to Berne and then to Strasburg. In 1541 his friends in Geneva succeeded in effecting his recall, when he laid before the council the draft of his ordinances respecting church discipline, which were immediately accepted and published. His college of pastors and doctors and his consistorial court of discipline formed a theocracy, with himself at the head of it, which aimed virtually at the management of all municipal matters and the control of the social and individual life of the

people. A magistrate was deposed and condemned to two months' imprisonment 'because his life was irregular, and he was connected with the enemies of Calvin.' James Gruet was beheaded 'because he had written profane letters and obscene verses, and endeavored to overthrow the ordinances of the church.' Michael Servetus, passing through Geneva in 1553, was arrested, and through Calvin's instrumentality was burnt alive because he had attacked the mystery of the Trinity in a book which was neither written nor printed at Geneva. This has been regarded as the great blot on Calvin's career, though approved of by many others of the reformers. His energy and industry were enormous: he preached almost daily, delivered theological lectures three times a week, attended all deliberations of the consistory, all sittings of the association of ministers, and was the soul of all the councils. He was consulted, too, upon points of law as well as of theology. Besides this, he found time to attend to political affairs in the name of the republic, to publish a multitude of writings in defense of his opinions, and to maintain a correspondence through all Europe. Up to 1561 the Lutherans and the Calvinists were as one, but in that year the latter expressly rejected the tenth article of the Confession of Augsburg, besides some others, and hence arose the name of *Calvinists*. Calvin retained his personal influence to the last; but a year or two before his death his health had broken down. As a theologian Calvin was equal to any of his contemporaries in profound knowledge, acuteness of mind, and in the art of making good a point in question. As an author he merits great praise. His Latin works are written with much method, dignity, and correctness. He was also a great jurist and an able politician. Besides the *Institutes*, the most important of Calvin's works are the *De Necessitate Reformandæ Ecclesiæ*, *In Novum Testamentum Commentarii*, and *In Librum Geneseos Commentarii*. The collected works of Calvin have been published in English by the Calvin Translation Society of Edinburgh in fifty-two vols. 8vo (1843–55).

**Calvinism** (kal'vin-izm), the theological tenets or doctrines of John Calvin, including a belief in predestination, election, total depravity, original sin, effectual calling, and the final perseverance of the saints. These doctrines were received before Calvin's days, though he is doubtless amongst the most learned and copious writers in their propagation and defense. The system also includes several other points of controversy, such as that of free-will, the Sonship of the Second Person of the Trinity, and other differences in doctrine as between Calvinists and Arminians. Calvinism is the theological system expounded in the Westminster Confession of Faith, and is therefore the faith officially held by the Presbyterian churches generally; it is also substantially identical with what is known as "evangelicalism" in any of the churches or religious bodies.

**Calvo** (käl'vō), CARLOS, diplomatist, born in Buenos Ayres in 1824; died in 1906. He was one of the founders of the Institute of International Law and later was Ambassador from Argentina to France. In 1902 he formulated the famous Calvo Doctrine, an extension of the Monroe Doctrine, at the time that Britain, Germany and Italy were blockading the ports of Venezuela to inforce the payment of a debt. He announced the principle that 'the collection of pecuniary claims made by the citizens of one country against the government of another should never be made by force.' In 1906 Dr. Louis Drago brought this principle before the Pan-American Congress at Rio de Janeiro, where it became known as the Drago Doctrine, and was one of the problems submitted to The Hague Peace Conference. Calvo was an author of historical and economic works, chief among them being his fifteen-volume *Historical Annals of the Revolution of Latin America*.

**Calx** (kalks; L., lime or chalk), a term formerly applied to the *residuum* of a metal or mineral which has been subject to violent heat, burning, or calcination.

**Calycanthus** (k a l-i-k a n'th u s), a genus of hardy American shrubs, of which one species, Florida allspice (*C. Floridus*), has yellow flowers, and is sweet scented.

**Calydon** (kal'i-don), an ancient city of Northern Greece, in Ætolia, celebrated in Greek mythology on account of the ravages of a terrible boar. All the princes of the age assembled at the famous Hunt of the Calydonian Boar, which was finally despatched by Meleager.

**Calymene** (ka-lim'e-nē), a genus of fossil trilobites found in the Silurian rocks.

**Calypso** (ka-lip'sō), in Greek mythology, a nymph who inhabited the island Ogygia, on the shores of which Ulysses was shipwrecked. She promised him immortality if he would consent to marry her, but after a seven years' stay

she was ordered by Hermes to permit his departure.

**Calyptra** (ka-lip'tra), the hood of the theca or capsule of mosses. The same name is given to any hoodlike body connected with the organs of fructification in flowering plants.

CALYPTRA. *a*, Moss. *b*, Capsule with calyptra. *c*, Do. with calyptra removed.

**Calyptræidæ** (ka-lip-trē'i-dē), a family of gasteropodous molluscs, known as bonnet or chambered limpets. The typical genus *Calyptræa* includes the cup-and-saucer limpet.

**Calystegia** (ka-lis-tē'ji-a), a genus of plants, order Convolvulaceæ. See *Bindweed.*

**Calyx** (kā'liks), in botany, the name given to the exterior covering of a flower; that is, the floral envelope consisting of a circle or whorl of leaves external to the corolla, which it encloses and supports. The parts or leaves which belong to it are called *sepals;* they may be united by their margins or distinct, and are usually of a green color and of less delicate texture than the corolla. In many flowers, however (especially monocotyledons), there is little or no difference in character between calyx and corolla, in which case the whole gets the name of *perianth.* When the calyx leaves are distinct the calyx is called *polysepalous* (*a a a* in accompanying cut); when united, *gamosepalous* or *monosepalous* (*b b*).

Forms of Calyx.

**Cam,** or GRANTA, an English river which rises in Essex, flows N. E. through Cambridgeshire, and falls into the Ouse after a course of about 40 miles.

**Cam,** in machinery, a simple contrivance for converting a uniform rotatory motion into a varied rectilinear motion, usually a projecting part of a wheel or other revolving piece so placed as to give an alternating or varying motion to another piece that comes in contact with it and is free to move only in a certain direction.

**Camaieu** (ka-mā'ū), monochrome painting or painting with a single color, varied only by gradations of the single color, by light and shade, etc. Drawings in India ink, sepia, etc., are classed as works *en camaieu.*

**Camaldolites** (ka-mal'dō-līts), CAMALDULIANS, or CAMALDUNIANS, a nearly extinct fraternity of monks founded in the Vale of *Camaldoli* in the Apennines in 1018, by St. Romuald, a Benedictine monk. They were originally hermits, but as their wealth increased they associated in convents. They have always been distinguished for their extreme aseticism, their rules in regard to fasting, silence, and penances being most severe. Like the Benedictines, they wear white robes.

**Camargue** (kä-märg), LA, the delta of the Rhône, in South France, department of Bouches-du-Rhône. It is protected from the inundations of the river by dikes, and is mostly an unhealthy tract of pools and marshes, only a small portion of it being cultivated.

**Camarilla** (ka-ma-ril'a), a word first used in Spain, but now in other countries also, for a company of secret counselors or advisers to a ruler: a cabal; a clique.

**Camayeu.** See *Camaieu.*

**Cambacérès** (käṅ-bâ-sā-rā), JEAN JACQUES RÉGIS DE, Duke of Parma, born in 1753 at Montpellier; died at Paris in 1824. He was trained a lawyer, and by his talents soon attracted the notice of the Convention, and was appointed to various judicial offices. In the discussion relative to the fate of the king he declared Louis guilty, but disputed the right of the Convention to judge him, and voted for his provisory arrest, and in case of a hostile invasion, death. For a time he had the management of foreign affairs; and when Bonaparte was first consul, Cambacérès was chosen second. After the establishment of the empire, Cambacérès was created arch-chancellor, grand officer of the Legion of Honor, and ultimately Duke of Parma. He was banished on the second restoration of Louis XVIII, but was subsequently permitted to return.

**Cambaluc** (kam'ba-luk), CAM'BALU, the name by which the city which we now know as Peking became known to Europe during the middle ages.

**Cambay** (kam-bā'), a feudatory state of Gujarat, India, tributary to Baroda. Area 350 sq. miles. Also, the capital of above state, situated at the head of the Gulf of Cambay, formerly a flourishing port, but now decayed. Pop. 36,000.—The gulf separates the

peninsula of Kathiawar from the northern coast of Bombay. Length, 80 miles; average breadth, 25 miles.

**Camberwell** (kam'bėr-wel), a suburb of London, S. side of the Thames, in the county of Surrey. Pop. 261,357. See *London*.

**Camberwell Beauty,** a rare British butterfly, *Vanessa Antiŏpa*. The wings are deep, rich, velvety brown, with a band of black, a row of large blue spots, and an outer band or margin of pale yellow dappled with black spots. The caterpillar feeds on the willow.

**Cambium** (kam'bi-um), in botany, a mucilaginous viscid substance forming a layer immediately under the liber or inner bark of plants, supposed to fulfil important functions in the formation of new wood. It is found only in exogenous stems.

**Cambodia** (kam-bō'di-a), or CAMBOJA, a country in the Indo-Chinese peninsula, bounded N. by Siam, E. by Anam, S. by French Cochin-China and Gulf of Siam, and W. by Gulf of Siam. The greater part of it is low and flat, with numerous streams, the chief being the Mekong or Cambodia River. The soil is very fertile, and the vegetation generally is marked by tropical luxuriance. Cattle are exceedingly numerous; among wild animals are the elephant and tiger; gold and precious stones are found. In early times Cambodia was a powerful state exacting tribute even from Siam, but it gradually fell into decay, and lost a large part of its dominions to Siam. Magnificent ruins attest the former prosperity. Since 1863 it has been a protectorate of France, and since 1884 practically a French colony, though ruled by a king of its own. The chief town is Pnom-Penh; the port is Kampot. Pop. estimated at 1,000,000 to 1,500,000, partly Cambodians proper, partly Siamese, Annamese, etc.

**Cambon** (kăn-bōn'), JULES, an illustrious French diplomat, born in 1845. He served in the Franco-Prussian War; was made director-general in the civil service of Algeria in 1874, and governor-general in 1891. In 1891-1902 he was French ambassador at Washington, and as such was the real diplomatic representative of Madrid in the Spanish-American war. Later, as ambassador from his country to Berlin, he made the Morocco pact that kept the peace between France and Germany.

**Camborne** (cam'born), a town of England, county of Cornwall, 11 miles N. W. of Falmouth, in the vicinity of productive tin and copper mines. Pop. (1911) 15,829.

**Cambrai** (kăn-brā; in German called *Kamerik* or *Kambryk*), a fortified French city, on the Scheldt, in the dep. Du Nord, 104 miles northeast of Paris; long celebrated for its manufacture of fine linens and lawns, whence similar fabrics are called *cambrics*. It is the seat of an archbishop, and has a cathedral, an archiepiscopal palace, townhouse, etc. Cambrai is the *Camaracum* of the Romans, by whom it was fortified. Pop. 21,791.—The *League of Cambrai*, a league formed in 1508 between Louis XII of France, the German Emperor Maximilian, and Ferdinand of Spain, for the purpose of humbling the Republic of Venice, and which was joined in 1509 by Pope Julius II. See *European War*.

**Cambria** (kam'bri-a), the Latin name of Wales, derived from Cymri, the name of the branch of the Celts to which the Welsh belong.

**Cambrian Rocks,** in geology, an extensive series of gritstones, sandstones, conglomerates, slates, and shales, lying under the Lower Silurian beds, and above the Archæan, and divided into the Upper and Lower Cambrian. Many fossils occur in the series, including sponges, star-fishes, trilobites, brachiopods, lamellibranchs, pteropods, gasteropods, cephalopods, etc. They may be regarded as the bottom rocks of the Silurian system, and are well developed in N. Wales (hence the name), but can be recognized in many other regions.

**Cambric** (kām'brik), originally the name of a fine kind of linen which was manufactured principally at Cambrai (German *Kambryk*) in French Flanders, whence the name. It is now applied to a cotton fabric, which is very extensively manufactured in imitation of the true cambric, and which is in reality a kind of muslin.

**Cambridge** (kām'brij), an inland county of England, bounded by the counties of Lincoln, Northampton, Huntingdon, Bedford, Hertford, Essex, Suffolk, and Norfolk; area 822 sq. miles. The soil is diversified and generally fertile; a large part belongs to the fen country. The principal rivers are the Cam or Granta, and the Ouse. By drainage much of the fen land (including the Bedford Level) has been converted into good arable land and into excellent pastures, and about nine-tenths of the county is under cultivation. The county abounds in dairy farms, celebrated for the production of excellent butter and cheese. The S. E. of the county, extending from Gogmagog Hills to Newmarket, being bare and heathy, is chiefly appropriated to sheep-rearing; on the S. the

ground produces fine wheat, barley, and oats. The county town is Cambridge; other towns are Ely, Wisbech, Newmarket, and March. Pop. 215.122.—CAMBRIDGE, the county town, is situated on the river Cam, 50 miles N. of London. It is an ancient place, and was a Roman station (Granta). It occupies a perfect level encompassed by the colleges, and their beautiful grounds and gardens, on both sides of the Cam. Several of the streets are narrow and winding, but some are spacious and airy, and much improvement has taken place of late years. The town is supported mainly by the presence of Cambridge University; but has some manufactures. Pop. (1911) 40,628.

**Cambridge,** UNIVERSITY OF, one of the two great English universities, as old at least as the thirteenth century, situated in Cambridge town. The following list contains the names of the colleges or distinct corporate bodies comprised in the university, with the time when each was founded:—

| | |
|---|---|
| 1. St. Peter's College, or Peter House | 1257 |
| 2. Clare College, formerly Clare Hall | 1326 |
| 3. Pembroke College | 1347 |
| 4. Gonville and Caius College | 1348 |
| 5. Trinity Hall | 1350 |
| 6. Corpus Christi College | 1352 |
| 7. King's College | 1441 |
| 8. Queen's College | 1448 |
| 9. St. Catherine's College, or Catherine Hall | 1473 |
| 10. Jesus College | 1496 |
| 11. Christ's College | 1505 |
| 12. St. John's College | 1511 |
| 13. Magdalene College | 1519 |
| 14. Trinity College | 1546 |
| 15. Emmanuel College | 1584 |
| 16. Sidney Sussex College | 1598 |
| 17. Downing College | 1800 |
| 18. Selwyn College | 1882 |

Each of these colleges is a separate corporation, which is governed by laws and usages of its own, although subject to the paramount laws of the university. At the head of each is an official who is generally styled the Master of the college. Next in rank come the Fellows (in number about 400), who are graduates and have formerly been distinguished students, and who receive an annual allowance from the college funds, varying from about $750 to $1250. The students (undergraduates) are of several classes, namely: *Fellow-commoners*, who are generally the younger sons of the nobility, or young men of fortune, pay high fees, and have the privilege of dining at the fellows' table; *scholars*, who are elected by examination or otherwise, and receive an annual allowance from the college funds; *pensioners*, who form the great body of the students and pay ordinary fees; *sizars*, students of limited means, who receive various emoluments. There is also a certain number of non-collegiate students. The head of each college and the fellows together form the governing body of the college. The university is composed of a chancellor, vice-chancellor, the masters or heads of colleges, fellows of colleges, and students, and is incorporated as a society for the study of all the liberal arts and sciences. The senate, which is composed of all who have taken the degree of Doctor or Master, is the great legislative assembly of the university. The chief executive power is vested in the chancellor, the high-steward, and the vice-chancellor, who is the head of some college. Two proctors superintend the discipline of all persons *in statu pupillari*. Bachelors of Arts may obtain 'honors' in the following departments—Mathematics, Classics, Moral Sciences, Natural Sciences, Law, History, Theology, Semitic Languages, Indian Languages, Mediæval and Modern Languages. The successful candidates in each of these departments are arranged in a *tripos*, that is, in three grades. In the mathematical tripos these three grades are called, respectively, Wranglers, Senior Optimes, and Junior Optimes; in the other triposes they are called first, second, and third class. Women who have fulfilled the conditions of residence and standing may be admitted to the tripos examinations. Those who pass are placed in the published lists, and receive certificates; but no degrees are conferred upon them. Two colleges (Girton and Newnham) have been established for women, but they are no part of the university, though many of the university lectures are open to students of these colleges. The annual income of the university was recently about $300,000, arising from various sources, including the produce of fees at matriculations, for degrees, etc. The total number of students, fellows, masters, etc., in the institution is over 13,000. A botanical garden, a medical school, an observatory, and a valuable library containing more than 500,000 printed volumes, besides many manuscripts, are attached to the university.

**Cambridge,** a city, capital of Guernsey Co., Ohio, 59 miles N. of Marietta. There are coal mines nearby, and a supply of natural gas. There are manufactures of sheet and tinplate, glass, earthenware, bars, chairs, etc.; also railroad shops, planing and woodworking mills, etc. Pop. 15,400.

**Cambridge,** a city of Massachusetts, separated from Boston by

Charles River. It is laid out with broad streets and many open spaces. It is the seat of Harvard University (which see), and was selected as the site of the Massachusetts Institute of Technology. It has been the home of many famous persons, and Mount Auburn Cemetery, nearby, contains the graves of many of the leaders in American literature. Longfellow's last residence, facing Charles River, is an object of interest to visitors. It is one of the oldest towns in New England and practically forms part of Boston, though distinct as a municipality. The city comprises Old Cambridge, North Cambridge, Cambridgeport and a part of Mt. Auburn. Pop. 104,839.

**Cambridge,** a town, capital of Dorchester County, Maryland, on the Choptank River, 40 miles S. S. E. of Annapolis. It has lumber and canning interests, and exports fish and oysters. Pop. 7000.

**Cambuskan** (kam-bus'kan), a prince of Cambaluc (Peking), His name is a corruption of Genghis Khan, but the story told of him applies to Kublai Khan, the conqueror of China. The story is partly told by Chaucer, is referred to by Milton in *Il Penseroso*, and is completed by Spenser in the *Faerie Queene*. Some of its romantic elements occur in *The Arabian Nights*, the *Panchatantra*, and elsewhere in oriental literature. See Clouston's *Popular Tales and Fictions* (1887).

**Cambusken'neth,** an ancient abbey of Scotland, now in ruins, near Stirling, founded in 1147 by David I.

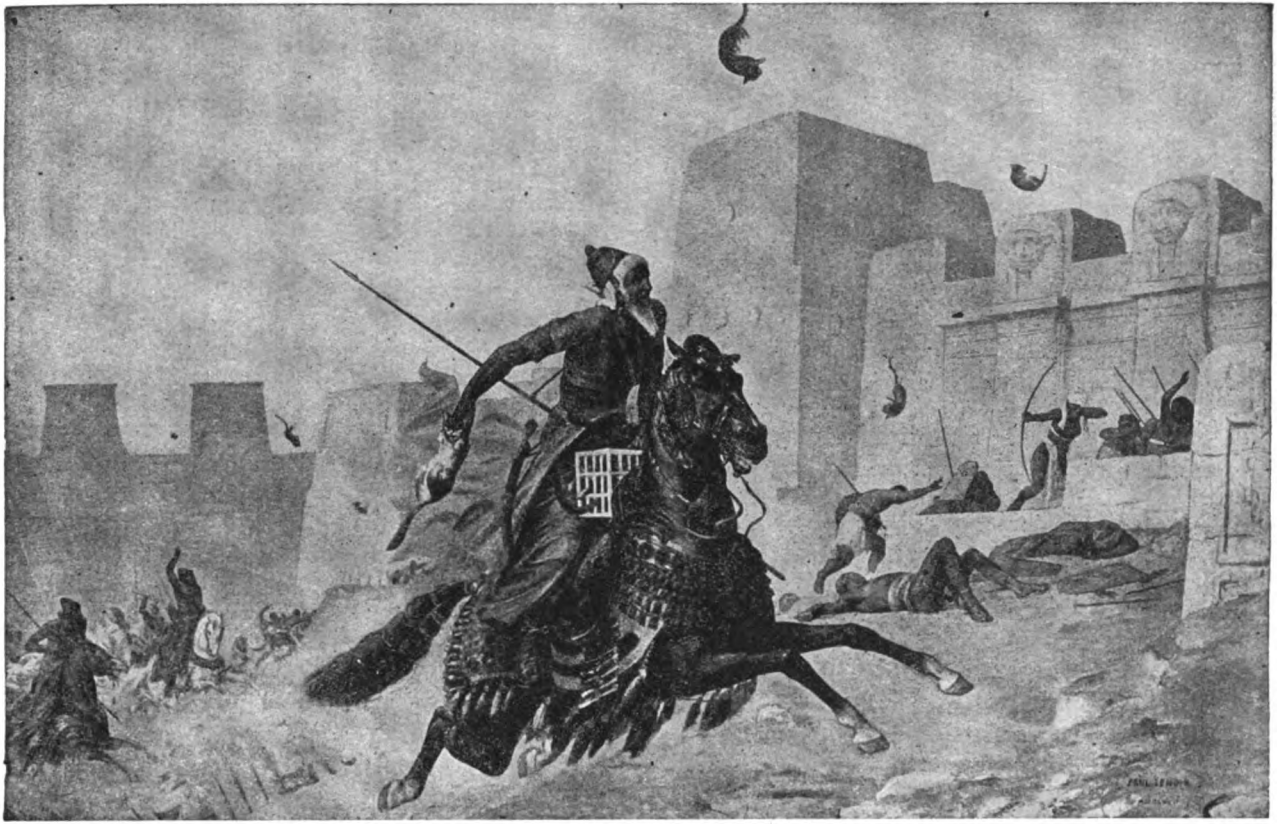
**Cambuslang',** a town of Scotland, 3¾ miles S. E. of Glasgow, with collieries adjacent. Pop. 8500.

**Cambyses** (kam-bī'sēz). (1) A Persian of noble blood, to whom King Astyages gave his daughter Mandane in marriage. Astyages was dethroned by Cyrus, the offspring of this union. (2) The son of Cyrus the Great, and grandson of the preceding, became, after the death of his father, King of the Persians and Medes, B.C. 529. In the fifth year of his reign he invaded Egypt, conquering the whole kingdom within six months. But his expeditions against the Ammonites and Ethiopians having failed, his violent and vindictive nature broke out in cruel treatment of his subjects, his brother Smerdis and his own wife being among his victims. He died in 521 B.C.

**Camden** (kam'den). WILLIAM, a celebrated antiquary and historian, was born in London in 1551. Appointed second master of Westminster School, he devoted all his leisure to the study of British antiquities, and began to collect matter for his great work, the *Britannia*, which gives a topographical and historical account of the British Isles from the earliest ages. In 1593 Camden became headmaster of Westminster, and four years afterward Clarencieux king-at-arms. Besides the *Britannia*, Camden published a narrative of the Gunpowder Plot, a history of the reign of Queen Elizabeth and an account of the monuments and inscriptions in Westminster Abbey. He died in 1623.

**Camden,** the county seat of Camden County, N. J., on the Delaware River, opposite Philadelphia, with which it is connected by several lines of steam ferries. Camden is an important shipping point; it has large market gardens in the suburban districts adjacent, and is noted for its manufacturing and shipbuilding interests. The leading manufactures are talking machines, soups, machinery, foundry products, cotton and woolen goods, oilcloth, lumber, chemicals, paints, steel pens, soaps, candies, boots, shoes, etc. A New York shipyard is located here. Camden was chartered as a city in 1828; the Camden and Amboy Railroad, incorporated in 1833, gave the city its early importance as a railroad terminus. It was the home of Walt Whitman from 1873 until his death, in 1892. Pop. 94,538.

**Camel** (kam'el; *Camēlus*), a genus of ruminant quadrupeds, characterized by the absence of horns; the possession of incisive, canine, and molar teeth; a fissure in the upper lip; a long and arched neck; one or two humps or protuberances on the back; a broad elastic foot ending in two small hoofs, which does not sink readily in the sand of the desert. The native country of the camel is said to extend from Morocco to China, within a zone of 900 or 1000 miles in breadth. The common camel (*Camēlus Bactriānus*), having two humps, is only found in the northern part of this region, and exclusively from the ancient Bactria now Turkestan, to China. The dromedary, or single-hump camel (*Camelus dromedarius*, or Arabian camel), is found throughout the entire length of this zone, on its southern side, as far as Africa and India. It is found throughout Egypt and the desert regions of Arabia and northern Africa. The Bactrian species is the larger, more robust, and more fitted for carrying heavy burdens. The dromedary has been called the race-horse of its species. To people residing in the vicinity of the great deserts the camel is an invaluable mode of conveyance. It will travel three days under a load and five days under a rider without drinking. The stronger varieties carry from 700 to 1000



**CAMBYSES AT THE SIEGE OF PELUSIUM**

When he besieged Pelusium, in 527 B. C., the Persian Emperor Cambyses placed at the head of his army a number of cats and dogs, and the Egyptians, who held these animals sacred as divinities, refused to defend themselves and became an easy prey.

19—2

lbs. burden. The camel's power of enduring thirst is partly due to the peculiar structure of its stomach, to which are attached little pouches or water-cells, capable of straining off and storing up water for future use, when journeying across the desert. It can live on little food, and of the coarsest kind, leaves of trees, nettles, shrubs, twigs, etc. In this it is helped by the fact that its humps are mere accumulations of fat (the backbone of the animal being quite straight) and form a store upon which the system can draw when the outside supply is defective. Hence the camel-driver who is about to start on a journey takes care to see that the humps of his animal present a full and healthy appearance. Camels which carry heavy burdens will do about 25 miles a day, those which are used for speed alone, from 60 to 90 miles a day. The camel is rather passive than docile, showing less intelligent co-operation with its master than the horse or elephant; but it is very vindictive when injured. It lives from forty to fifty years. Its flesh is esteemed by the Arab and its milk is his common food. The hair of the camel serves in the East for making cloth for tents, carpets and wearing apparel. It is imported into European countries for the manufacture of fine pencils for painting and for other purposes. The South American members of the family Camelidæ constitute the genus *Auchenia*, to which the llama and alpaca belong; they have no humps.

Figs. 1 and 2, Arabian Camels and Camel-driver. Fig. 3, Bactrian or two-humped Camel.

**Camel,** a water-tight box or caisson used to raise a sunken vessel, or to float a vessel over a shoal or bar. It is let down with water in it, and is attached to the vessel, after which the water is pumped out, and the camel rises from its buoyancy.

**Camelford** (kam'el-ford), a village, and, previous to 1832, a parliamentary borough of England, county of Cornwall, on the Camel, 28 miles N. W. Plymouth. Camelford is the Camelot of Arthurian romance, and four miles to the N. W. of Camelford are the ruins of King Athur's castle of Tintagel.

**Camellia** (ka-mēl'ya), a genus of plants, order Ternstrœmiaceæ (the tea order), with showy flowers and elegant dark-green, shining, laurel-like leaves, nearly allied to the plants which yield tea, and named from George Joseph Kamel, a Moravian Jesuit. The *C. Japonica*, in Japan and China, is a lofty tree of beautiful proportions. It is the origin of many double varieties of our gardens. Besides this species, the *C. Sasanqua*, with small, white, scentless flowers, and the *C. reticulata* (net-veined), with its large peony-like flowers, are cultivated in the United States.

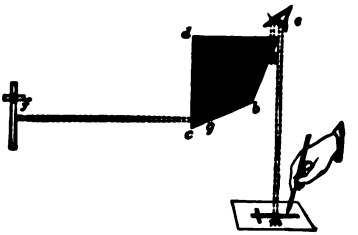
**Camelopard** (ka-mel'ō-pard, kam'el-ō-pard), a name given to the giraffe (*Camelopardālis giraffa*), originally from the notion that it was a kind of hybrid between a camel and leopard. It constitutes the only species of its genus and family (Camelopardalidæ or Devexa). See *Giraffe*.

**Camel's Thorn** (genus *Alhagi*), a name of several plants belonging to the natural order Leguminosæ, and the suborder Papilionaceæ. They are herbaceous or half-shrubby plants growing in the deserts of Egypt and the East, and derive their

name from the fact that they afford a food relished by camels. Some of the species yield a manna-like exudation from the leaves and branches.

**Cameo** (kam'ē-ō), a general name for all gems cut in relief, in contradistinction to those hollowed out, or *intaglios*. More particularly, a cameo is a gem composed of several different-colored layers having a subject in relief cut upon one or more of the upper layers, an under layer of a different color forming the ground. For this purpose the ancients used the onyx, sardonyx, agate, etc. The shells of various molluscs are now much used for making cameos; and they are also imitated on glass.

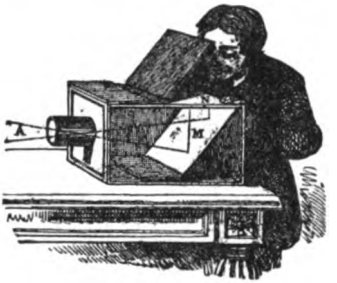
**Camera Lucida** (kam'e-ra lu'si-da; Latin, 'clear chamber'), an optical instrument employed to facilitate the sketching of objects from nature by producing a reflected picture of them upon paper. Wollaston's apparatus is one of the commonest. The essential part is a totally-reflecting prism with four angles, one of which is 90°, the opposite one 135°, and the other two each 67° 30'. One of the two faces which contain the right angle is turned towards the object to be sketched. Rays falling in a straight line on this face, as from *f*, are totally reflected at *g* from the face *c b* to the next face at *h*, whence they are again totally reflected to the fourth face, from which they emerge in a straight line. An eye (*e*) placed so as to receive the emergent rays, will see an image of the object in the direction *m*, and by placing the sketching paper below in this place, the image may be traced with a pencil. As the paper, for convenience of drawing, must be a distance of about a




Camera Lucida.

foot, a concave lens, with a focal length of something less than a foot, is placed close in front of the prism in drawing distant objects. By raising or lowering the prism in its stand, the image of the object to be sketched may be made to coincide with the plane of the paper. The prism is mounted in such a way that it can be rotated either about a horizontal or a vertical axis; and its top is usually covered with a movable plate of blackened metal, having a semicircular notch at one edge, for the observer to look through. This form of camera has undergone various modifications. It is very convenient on account of its portability.

**Camera Obscura** (L., 'dark chamber'), an optical instrument employed for exhibiting the images of objects in their forms and colors, so that they may be traced and a picture drawn, or may be represented by photography. A simple camera obscura is presented by a darkened chamber into which no light is permitted to enter excepting by a small hole in the window-shutter. A picture of the objects




Camera Obscura.

opposite the hole will then be seen on the wall or on a white screen placed opposite the opening. A simple camera obscura is shown in the figure; the rays of light passing through a convex lens at A, being reflected from the mirror M (which is at a slope of 45°) to the glass plate N, where they form an image that may be traced. Another arrangement is a kind of tent surrounded by opaque curtains, and having at its top a revolving lantern, containing a lens with its axis horizontal, and a mirror placed behind it at a slope of 45°, to reflect the transmitted light downwards on the paper. It is still better to combine lens and mirror in one by using a glass of peculiar shape, in which rays from external objects are first refracted at a convex surface, than totally reflected at the back of the lens, which is plane, and finally emerge through the bottom of the lens, which is concave, but with a larger radius of curvature than the first surface. The camera obscura employed by photographers is commonly a box, one half of which slides into the other, with a tube in front containing an object-glass at its extremity. At the back of the box is a slide of ground glass, on which the image of the object or objects to be depicted is thrown, in setting the

instrument. The focusing is performed in the first place by sliding the one half of the box into the other, and by means of a pinion attached to the tube in front which moves the lens. When the image has thus been rendered as sharp as possible, the ground-glass slide is removed, and a sensitized plate substituted, which not only receives but retains the image.

**Camerino** (kà-ma-rē'no), a town of Central Italy, province of Macerata, 41 miles S. W. of Ancona, seat of an archbishopric, with archiepiscopal palace and a spacious cathedral. Pop. 4511.

**Cameron** (kam'e-ron), RICHARD, a Scottish Covenanter, born at Falkland in Fife. Becoming an enthusiastic votary of the pure Presbyterian system, on the 20th of June, 1680, at the head of a small band of followers, he entered Sanquhar, and formally renounced allegiance to the king (Charles II) on account of his misgovernment. The little band kept in arms for a month in the mountainous country between Nithsdale and Ayrshire, but was at length surprised by a much superior force at Aird's Moss, and after a stubborn fight was overcome, Cameron being among the slain. See *Cameronians.*

**Cameron,** SIMON, politician, born near Lancaster, Pennsylvania, in 1799; died in 1889. He became editor of a Democratic paper in Harrisburg, acquired a large fortune in banking and railroading, and engaged actively in politics, being elected United States Senator in 1845. In 1855 he joined the Republican party; was again elected Senator; was secretary of war in Lincoln's cabinet in 1861; minister to Russia; and again elected senator in 1866 and 1872. As such he ruled the party in Pennsylvania, where he was long the dominant figure in politics.—His son, JAMES DONALD, born 1833, succeeded him in political lordship and in the Senate, being U. S. Senator 1877–97 and Secretary of War in 1895. Becoming an advocate of free silver, he declined renomination by the Republican party. Died 1907.

**Cameron,** VERNEY LOVETT, an African traveler, born near Weymouth, England, in 1844. He entered the navy in 1857, and in 1872 was chosen by the Royal Geographical Society of London to conduct an expedition for the relief of Dr. Livingstone. He was only in time to meet the remains of Livingstone at Unyanyembe, but continued his journey west to Benguela, and was thus the first to cross Central Africa. Returning to England in 1876, he was made Companion of the Bath, and raised to the rank of a commander. In 1878 he made a journey through Asia Minor and Persia. He has published accounts of both journeys in his *Across Africa* and *Our Future Highway to India.*

**Cameronians,** the name applied to the small but zealous sect of Presbyterians which Richard Cameron led.

**Cameroons** (kam-a-röns'). (1) A district on the West Coast of Africa, on the Bight of Biafra, now belonging to Germany, and one of the most suitable districts for colonization in this region. (2) A river in the Cameroons territory. It falls into a broad estuary, on approaching which it has a width of about 400 yards. There are several large and thriving towns (including King Bell's town) on the river, through which an extensive trade is carried on in ivory and palm-oil. (3) A mountain range in the territory, the highest peak of which has been estimated at over 13,000 feet. It is volcanic in character, and is clothed with a dense growth of forest to the height of 4000 or 5000 ft.

**Camillus** (kam-il'us), MARCUS FURIUS, a Roman patrician, famous as the deliverer of the city of Rome from the Gauls. In B. C. 396 he was made dictator during the Veientine war, and captured the town of Veii by mining, after it had defied the Roman power for ten years. In B. C. 394 Camillus besieged the Falerii, and by an act of generosity induced them to surrender. Three years after, the envy and jealousy of enemies caused him to exile himself for a time, and he was living in retirement when the Gauls under Brennus invaded and captured Rome, with the exception of the Capitol. Camillus was now appointed dictator a second time, and was successful in repelling the invaders. After having been four times appointed dictator, a new invasion of the Gauls called Camillus, now eighty years old, again to the front, and for the fifth and last time, being appointed dictator, he defeated and dispersed the barbarians. He died in B. C. 365. Probably there is a considerable amount of myth in the story of his life.

**Camisards** (kam'i-sards), Calvinists in France (in the Cevennes), who, in the beginning of the eighteenth century, in consequence of the persecution to which they were exposed after the revocation of the Edict of Nantes in 1685, rose against the royal deputies. A large army was required to put them down (1702-1705), and great numbers were massacred, the French government considering it a laudable work to

suppress the Protestant heresy in this bloody manner. The name is from *camise*, a provincial form of French *chemise*, a shirt, because their ordinary outer garment was a kind of shirt or blouse.

**Camlet** (kam'let), a fabric made of long wool, hand spun, sometimes mixed with cotton, silk, or linen: originally made of camel's hair or of the hair of the Angora goat.

**Cammaerts** (kăm'mārts), EMILE, a Belgian poet, was born in Brussels, March 16, 1878, and was educated there, becoming in 1896 a student at the new university, where he specialized in geography. In 1899 he was elected professor of geography at the Institut Commercial of Mons. He retained his professorship until 1908, and during that time published several translations of Ruskin, and did other journalistic and literary work. In 1908 he married and settled in England, devoting his time to poetry and other literary work.

**Camoens** (kam'ō-ens), LUIS DE, the most celebrated poet of the Portuguese, born at Lisbon of a good family, probably in 1524 or 1525. An affray was the cause of his embarking in 1553 for India. He landed at Goa, but, being unfavorably impressed with the life led by the ruling Portuguese there, wrote a satire which caused his banishment to Macao (1556). Here, he wrote the earlier cantos of his great poem, the *Lusiad*. Returning to Goa in 1561, he was shipwrecked and lost all his property except his precious manuscript. After much misfortune Camoens in 1570 arrived once more in his native land, poor and without influence, as he had left it. The *Lusiad* was now printed at Lisbon (1572), and celebrating, as it did, the glories of the Portuguese conquests in India, acquired at once a wide popularity. But the only reward Camoens obtained was a pittance insufficient to save him from poverty. He died on the 18th of June, 1579. Fifteen years after his death a magnificent monument was erected to his memory, with an inscription on it which called him the prince of poets. The *Lusiad* is an epic poem in ten cantos. Its subject is the voyage of Vasco da Gama to the East Indies. The other works of Camoens consist of sonnets, songs, epigrams, dramas, etc.

**Camomile** (kam'ō-mil). See *Chamomile*.

**Camorra** (ka-mor'a), a well-organized secret society, once spread throughout all parts of the kingdom of Naples. At one time the *Camorristi* were all powerful, levying a kind of blackmail at all markets, fairs, and public gatherings, claiming the right of deciding disputes, hiring themselves out for any criminal service from the passing of contraband goods to assassination. It had central stations in all the large provincial towns, and a regular staff of recruiting officers. Though properly a secret society, it did not find it necessary under the régime of the Bourbons to conceal its operations; but under the present government of united Italy, the society has lost almost all its power, except in the wilder parts of Southern Italy. In 1910-11 a large number of them were arrested and put on trial for complicity in the murder of Cuocolo Gennaro and his wife. The trial finally terminated July 8, 1912, with the conviction of twenty-six. Imprisonment for thirty years was the severest sentence imposed upon any Camorrist—a penalty to be followed by ten years of police surveillance. The result of the trial at Viterbo, it is believed, must be to break the spell of the Camorra, once so powerful, accepted as a government within a government, a secret society too strong to be broken up.

**Camouflage** (cam'ou-fläzh), a recently coined word, whose possible origin may be traced from the Latin (calmo flatus, smoke puffed in the face of a person asleep, mystification) through the French (camoufler—to render one's self unrecognizable). It has been defined as 'the concealment of the presence of a person or thing by causing his or its color to blend with his or its surroundings.' Like all arts it is an imitation of nature, which is the greatest of camouflagists, the chameleon being the best prototype. In the European War the French adopted camouflage to conceal, by the employment of color, the presence of guns or men, which are made to resemble trees or houses.

**Camp**, the place and aggregate body of tents or huts for soldiers in the field. Among the Greeks, the Lacedæmonians seem to have been the first who devoted attention to the art of forming military camps, adopting a circular form with the general's tent in the center; but the Romans, who had so often to carry on wars in distant and thinly-populated regions, were the first to carry the art of encampment to a high degree of perfection. Their camps as a rule were square, and were strongly intrenched so as to provide against the danger of surprise. Since the invention of gunpowder intrenched camps have become much more elaborate affairs and cover a much greater area. They may consist of intrenched areas permanently connected with and under the protection of fortified places; thus they are sometimes attached to certain large cities on the chief roads,

partly in order to defend them against the first attack of the enemy, partly to give to retreating armies rallying-points able to furnish support to numerous soldiers. Camps which, though intrenched, are to be occupied merely for the period of a campaign, or which serve as a refuge for a few days only to a subordinate army, are termed 'lines' or 'temporary positions.' From the perfection of modern artillery strong detached forts form the chief defensive feature of intrenched camps of the present day.—*Camps of instruction* are formed in time of peace for training and disciplining soldiers in camp life.

**Campagna** (kâm-pân'yâ), a town of S. Italy, province of Salerno, surrounded by high mountains. It is a seat of a bishopric, and contains a superb cathedral. Pop. 8927.

**Campagna di Roma,** the coast region of Middle Italy, in which the city of Rome is situated, from 30 to 40 miles wide and 100 long, and forming the undulating and mostly uncultivated plain which extends from near Civita Vecchia or Viterbo to Terracina, and includes the Pontine Marshes. The district is volcanic, and its lakes, Regillus, Albano, Nemi, etc., are evidently craters of extinct volcanoes. The soil is very fertile in the lower parts, though its cultivation is much neglected, owing to the malaria which makes residence there during midsummer very dangerous; and during the months of July, August, and September its inhabitants, chiefly herdsmen and peasants, seek refuge in Rome or the neighboring towns. In ancient times the Campagna, though never a salubrious district, was well cultivated and populated, the villas of the Roman aristocracy being numerous here. But inundations from the Tiber, and the discouragement of agricultural industry in the midst of wars and devastations, left the stagnant waters to become a source of pestilence, and the district became little better than a desert, nothing of its former prosperity being visible but the ruins of great temples, circuses, and monuments, and long rows of crumbling aqueducts overgrown with ivy and other creeping plants. Attempts to redeem part of the Campagna have often been made, but until recently without much success. The Italian government has now taken up the problem, and with large resources at its command has shown itself able to overcome the difficulty. It has been discovered that mosquitoes carry and distribute germs of malaria; hence an active mosquito-destroying campaign is waged; by a system of drainage, the deserted district has been largely redeemed, farming operations have become extensive and its population is increasing with encouraging rapidity.

**Campaign** (kam-pân') generally denotes the series of operations of an army during the time it keeps the field in one season or accomplishes a determinate object. Formerly campaigns lasted only during the warmer months, and were terminated by the troops retiring into winter quarters.

**Campan** (kăn-păn), JEANNE LOUISE HENRIETTE, born at Paris in 1752, became reader to the daughters of Louis XV; afterwards gained the favor of Queen Marie Antoinette, and, as lady of the bedchamber, served that ill-fated sovereign with much fidelity till the events of the Revolution separated them. After the fall of Robespierre Madame Campan established a boarding-school for young ladies at St. Germain, which soon acquired a wide reputation. She is chiefly remembered for her interesting memoirs respecting the private life of Marie Antoinette, her *Journal of Anecdotes*, and her correspondence with Queen Hortense.

**Campanella** (kâm-pâ-nel'lâ), TOMMASO, a learned Italian monk, born 1568. He entered the order of the Dominicans and studied theology and other branches of knowledge with assiduity, but was principally attracted by philosophy. In 1591 he published at Naples a philosophical work intended to show the futility of the prevailing doctrines of the Aristotelian schools. This book procured him some admirers, and more enemies. In 1599 he was arrested on a charge of conspiracy against the Spanish government, to which Naples was then subject, was imprisoned, and, after being repeatedly tortured, condemned to perpetual confinement. In this situation he wrote many learned works, afterwards published. At length, in 1629, Pope Urban VIII procured his liberty and bestowed a pension on him. Dreading further persecution, he withdrew in 1634 to France, where he was honorably received. He died in Paris in 1639. Among his numerous works are *Atheismus Triumphatus; Discorsi della Libertà; Prodromus Philosophiæ Instauranda; De Sensu Rerum et Magia.*

**Campanero** (kam-pa-nā'ro), the bell-bird.

**Campania** (kam-pā'ni-a), the ancient name of a province of Italy, in the former kingdom of Naples, which was a favorite resort of

wealthy Romans, who built there magnificent country houses. It comprises the modern provinces of Caserta, Naples, and parts of Salerno and Avellino. Cumæ (the oldest Greek settlement in Italy), Puteoli, Naples, Herculaneum, Pompeii, Baiæ, Stabiæ, Salernum, and Capua (its ancient capital) were the principal cities of Campania. Even now Campania is the most beautiful and fruitful part of Italy.

**Campanile** (kam-pa-nē'le, nil), a bell-tower detached from the church to which it belongs, common in the church architecture of Italy. Amongst the most remarkable examples are the beautiful campanile of the cathedral at Florence, designed by Giotto, and the famous leaning tower of Pisa.

**Campanula** (kam-pan'ū-la), the bellflower genus, a large genus of plants which gives its name to the order Campanulaceæ. The species are herbaceous plants, with bell-shaped flowers usually of a blue or white color. It includes several American species, which are known to all lovers of wild flowers. *C. rotundifolia*, the harebell or rockbell flower, found in all the States on damp rocks and rocky streams, is an exceedingly delicate plant. *C. aparinoides* is the prickly bellflower.

**Campanulaceæ** (kam-pan-ū-lā'se-ē), the bellworts, an extensive natural order of monopetalous, dicotyledonous plants, usually herbaceous, with an inferior two- or more-celled fruit, many minute seeds, regular bell-shaped showy blue or white corolla, and milky, acrid juice. They are natives chiefly of northern and temperate regions. See *Campanula*.

**Campbell of Argyle.** See *Argyle*.

**Campbell,** Sir Colin. See Lord *Clyde*.

**Campbell** (kam'el), Alexander, born in County Antrim, Ireland, in 1788; died in 1866. He came to the United States in 1809, where he became the founder of the religious sect known as 'Disciples of Christ.' Finding nothing in the creeds of the various sects to satisfy him, he declared against all existing creeds, and made the Bible his only rule of faith. He founded and was long president of Bethany College, in Virginia, and published as his party organ the *Christian Baptist and Millennial Harbinger*.

**Campbell,** Bartley, dramatist, born at Allegheny City, Pennsylvania, in 1843; died in 1888. A journalist in Pittsburgh, and then in New Orleans, he wrote *Through Fire*, *The Virginians*, *My Partner*, *The White Slave*, *Fairfax*, and other popular plays.

**Campbell,** George, an eminent Scottish divine, born at Aberdeen in 1709, educated at Marischal College, and in 1759 appointed principal of this college. In 1763 he published a celebrated dissertation on miracles in answer to Hume, and in 1776 his *Philosophy of Rhetoric*, which established his reputation as a critic and thinker. He died in 1796.

**Campbell,** George W., born in Tennessee, in 1768; died in 1848. He was a representative in Congress 1803–09, Senator 1811, Secretary of the Treasury 1815, and Senator again 1816–18, when he was sent by President Monroe as Minister to Russia.

**Campbell,** Helen Stuart, author, born in Lockport, New York, in 1839. She wrote books for girls, including the *Ainslee Series*, *American Girl's Home Book*, *Under Green Apple Boughs*, etc. In later years she became active in the cause of social and industrial reform and published *Prisoners of Poverty*, *Problem of the Poor*, *In Foreign Kitchens*, etc.

**Campbell,** John, Lord Campbell, Lord-chancellor of England, was the son of Dr. George Campbell, minister of Cupar-Fife, and was born there in 1779. He was educated at Cupar, and afterwards at the University of St. Andrews. In 1798 he went to London, and after acting some time as reporter and theatrical critic to the *Morning Chronicle*, entered himself a student of Lincoln's Inn, and in 1806 was called to the bar. He acquired a considerable practice, was elected member of Stafford in 1830, and was two years after made solicitor-general. In 1841 he was created Lord-chancellor of Ireland and raised to the peerage as Baron Campbell of St. Andrews. Some years after he accepted a post in the ministry of Lord John Russell; in 1850 was made chief-justice of the Queen's Bench, and nine years after was raised to the speakership of the House of Lords as Lord-chancellor. He died 23d June, 1861. He is known as the author of a considerable work, *Lives of the Chancellors*, which, with its supplementary vols., *Lives of the Chief-justices*, enjoyed great popularity.

**Campbell,** John Francis, folklorist, born at Islay, Scotland, in 1822; died in 1885. Educated at Eton and Edinburgh, he traveled widely, and made valuable researches into Gaelic folklore, embraced in his important work *Popular Tales of the West Highlanders* (4 vols. 1860–62). He issued a series of

Gaelic texts, entitled *Leabhair na Feinne*. A scientific student, he wrote in this field *Frost and Fire, Natural Engines, Toolmarks and Chips*, and *Thermography*, and invented an instrument to record the intensity of the sun's rays. His travels were described in his *Circular Notes*.

**Campbell,** THOMAS, a distinguished modern poet, was born at Glasgow July 27, 1777, and educated at its university. After leaving the university he resided for a short time in Edinburgh; and won sudden fame by publishing, in 1799, his *Pleasures of Hope*. In 1803, after spending some time in Germany, he published an edition of the *Pleasures of Hope* with the addition of some of the finest lyrics in the English language, including *Hohenlinden*, *Ye Mariners of England*, and the *Exile of Erin*. In 1803 he went to London, and in 1806 obtained a pension of £200 through the influence of Mr. Fox. After this he appears to have given his attention less to poetry than prose, and wrote various compilations, articles for Brewster's *Edinburgh Encyclopædia*, etc. In 1809 he again made his appearance as a poet, and published *Gertrude of Wyoming*, *Lord Ullin's Daughter*, and the *Battle of the Baltic*. After publishing *Specimens of English Poets* accompanied by critical essays, he became editor in 1820 of the *New Monthly Magazine*. He took an active part in the foundation of London University, and in 1827 was elected rector of Glasgow University. After this he continued to occupy himself with literature, but his productions were much inferior. He died at Boulogne, June 15, 1844, and was interred at Poets' Corner in Westminster Abbey.

**Campbell-Bannerman,** SIR HENRY, an English statesman, born in 1836, educated at Glasgow and Cambridge. He held in succession the posts of Financial Secretary to the War Office, Secretary to the Admiralty, Chief Secretary for Ireland and Secretary of State for War, and was knighted in 1895. He became the Liberal leader in the House in 1899, and in December, 1905, succeeded Balfour as Premier. In 1907 he introduced a measure to limit the power of the House of Lords. He resigned on account of ill health April 5, 1908, and died April 22.

**Campbell Island,** a small uninhabited island in the S. Pacific, southeast of New Zealand, to which it belongs. Mountainous and well wooded, and with fine harbors occasionally visited by whaling vessels.

**Campe** (käm'pe), JOACHIM HEINRICH, a German author and publisher, born in 1746; died in 1818.

**Campeche** or CAMPEACHY (kam-pē'chi, kam-pech'e), a seaport of Mexico, in the state and on the bay of the same name, on the W. coast of the peninsula of Yucatan, a mart for logwood and wax. Cigars are manufactured, and ships are built, though the harbor can admit only small vessels. Pop. 17,109.—The state of Campeche has an area of 18,087 sq. miles; pop. 86,542.

**Campen.** See *Kampen*.

**Camper** (kàm'pêr), PETER, a Dutch physician and anatomist, professor of medicine, etc., successively at Franeker, Amsterdam and Groningen; born at Leyden in 1722, and died at The Hague in 1789. He was skilful in drawing and painting, and rendered important services to art in his work on the relations of anatomy and art.

**Camp Fire Club of America,** an association founded in 1897 and reorganized in 1903, with William T. Hornaday as president. It is composed of American sportsmen and nature lovers, its purpose being to establish standards of sportsmanship, promote good fellowship, etc. Important services were rendered by it in the establishment of Glacial National Park and of Goat Mountain Park, British Columbia, preserving the fur seals from slaughter, protection of migratory birds, prohibition of the use of birds' plumage for millinery purposes, etc.

**Camp-Fire Girls,** an organization of girls, similar in many ways to the organization of Boy Scouts, which has for its symbol, fire, and for its watchwords, *Work*, *Health* and *Love*. The organization is largely the work of its president, Luther H. Gulick, who sought to add the power of organization and charm of romance to work, health and play. Any girl of twelve years or older may join the organization by applying for membership to a local Camp Fire and by signifying her wish to comply with the law. There are seven points in the law: (1) 'Seek beauty'; (2) 'Give service'; (3) 'Pursue knowledge'; (4) 'Be trustworthy'; (5) 'Hold on to health'; (6) 'Glorify work'; (7) 'Be happy.' Each local Camp Fire chooses a distinctive name and is in charge of a guardian, who must be at least twenty-one years of age. The national headquarters are in New York.

**Camphene** (kam'fēn), the generic name for the volatile oils or hydrocarbons, isomeric or polymeric

with oil of turpentine, as oil of bergamot, cloves, copaiba, hops, juniper, orange, pepper, etc. They are liquid at ordinary temperatures, and are distinguished from each other by their odors.

**Camphine** (kam'fēn), the commercial term for purified oil of turpentine, obtained by distilling the oil over quicklime to free it from resin. It was used in lamps, and gave a very brilliant light; though to prevent smoking, the lamp had to have a very strong draught.

**Camphor** (kam'fur), a whitish, translucent substance, a stearopten, of a granular or foliated fracture and somewhat unctuous to the touch, which is extracted from several kinds of trees of the laurel tribe. It has a bitterish, aromatic taste and a strong characteristic smell. It is lighter than water. In chemical character it belongs to the vegetable oils. The common camphor of the shops is obtained from *Camphŏra officinārum* (*Cinnamōmum* or *Laurus Camphŏra*), the camphor laurel, a native of China and Japan, now naturalized in many other countries. The camphor is chiefly prepared in the island of Formosa, though also exported from Japan, and to a small extent from China. *Borneo camphor* is the product of *Dryobalānops Camphŏra*, nat. order Dipteraceæ, a tree 100 to 130 feet high, found in Borneo and Sumatra. The common camphor is obtained from the wood by distillation and sublimation. Borneo camphor, on the other hand, is not procured by distillation, but is found in masses, secreted naturally in cavities in the trunk and greater branches. Numerous other vegetables, such as thyme, rosemary, sage, etc., are found to yield camphor by distillation. It is also prepared synthetically from coal-tar, which variety is used as a moth destroyer. In medicine camphor is used both as an external and internal stimulant. In small doses it acts as an anodyne and antispasmodic; in large doses it acts as a poison. Its effluvia being very noxious to insects, it is much used to protect specimens in natural history. It readily dissolves in alcohol, oils, etc., and in this way is much used as a liniment. It evaporates or volatilizes at ordinary temperatures. A third kind of camphor, *blumea camphor*, is prepared in China from *Blumĕa balsamifĕra*, a tall composite plant.

Camphor-tree (*Camphŏra officinārum*).

**Camphausen** (kamp'hou-zen), WILHELM, painter of battle-pieces, born at Dusseldorf in 1818; died in 1885. His works include *Cavaliers and Roundheads*, *Charles I at Naseby* and *Prince Eugene at Belgrade*.

**Campi** (kam'pē), a family of Italian artists who founded what is known in painting as the school of Cremona. Of the four of this name, Giulio, Antonio, Vincenzo, and Bernardino, the first and the last are the best known. Giulio (1502–72), the eldest and the teacher of the others, was a pupil of Giulio Romano, and acquired from the study of Titian and Pordenone a skill in coloring which gave the school its high place. Bernardino (1525–90) was the greatest of the school. He took Romano, Titian, Correggio in succession as his models, but without losing his own individuality as an artist.

**Campion,** the popular name of certain plants. See *Lychnis* and *Silene*.

**Campion** (kam'pi-on), EDMUND, an English Jesuit, born 1540. He was educated at Oxford, and distinguished himself greatly. Though at first a Roman Catholic, he adopted nominally the Reformed faith, and took deacon's orders in the Church of England; but he afterwards recanted, became a Jesuit, and attacked Protestantism, especially in his work *Decem Rationes* (Ten Reasons). In 1581 he was found guilty on a trumped-up charge of conspiring to raise sedition, and was accordingly executed.

**Campmeeting,** a woodland gathering for religious purposes, continuing for several days, and especially associated with Methodism in America. Introduced into England in 1799, they there led to the separation of the Primitive Methodists from the Wesleyans. At first they were scenes of hysterical excitement, though now they are generelly quiet gatherings of devout people.

**Campobasso** (kä m-p ō-b ä s's ō), a town of Italy, province of Campobasso, on a hill-slope, 52 miles N. E. Naples; has manufactures of cutlery and a good trade. Pop. 11,273.—The prov. (formerly Molise) has an area of 1771 sq. miles; pop. 300,873.

**Campobello** (k a m-p ō-b e l'l ō), an island 8 miles long, belonging to New Brunswick, Canada, in the Bay of Fundy, with a lighthouse on its northern extremity.

**Campo-Formio,** a town in Italy, 66 miles N. E. of

Venice, famous for the treaty of peace between Austria and France which was signed in its neighborhood on the 17th of October, 1797. Its chief provisions were that Austria should cede the Belgian provinces and Lombardy to France, receiving in compensation the Venetian states.

**Campo-Santo** (lit. 'Holy Field'), the name given to burying-grounds in Italy, best known as the appellation of the more remarkable, such as are surrounded with arcades and richly adorned. The most famous Campo-Santo is that of Pisa, which dates from the 12th century, and has on its walls frescoes of the 14th century of great interest in the history of art. Among more modern Italian cemeteries, that of Genoa is distinguished for its magnificence.

**Campus Martius** (called also *Campus*, merely) was a large place in the suburbs of ancient Rome, consisting of the level ground between the Quirinal, Capitoline, and Pincian Hills, and the river Tiber, set apart for military exercises and sacred to the god Mars. In the later period of the republic it was a suburban pleasure-ground for the Romans, and was laid out with gardens, shady walks, baths, etc. A large part of the modern city stands on it.

**Camtoos** (kam'tös), a river of Southern Africa, in Cape Colony, which falls into the sea west of Algoa Bay; length, 200 miles.

**Camuccini** (kȧ-mu̯t-chē'nē), VINCENZO, a distinguished Italian historical painter, born at Rome about 1775. He followed the pseudo-classical style, and his pictures are of large size. Among his best-known works are *Death of Cæsar*, *Death of Virginia*, *The Incredulity of Thomas*, *Horatius Cocles*, *Death of Mary Magdalene*. He was also excellent in portraits. He died in 1844.

**Camwood,** a red dyewood imported from tropical West Africa, and obtained from the *Baphia nitida*, a leguminous tree, suborder Cæsalpiniæ. This wood is of a very fine color, and is used in turnery for making knife handles and other similar articles. The dye obtained from it is brilliant, but not permanent. It is called sometimes *Barwood*, though this name belongs also to another tree.

**Cana** (kā'na), a village of Palestine, in Galilee, the scene of Christ's first miracle; probably represented by Kana el Jelil, a modern village 9 miles N. of Nazareth.

**Canaan** (kā'nan). See *Palestine*.

**Canaanites** (kā'nan-īts), the general name for the several peoples (Jebusites, Hittites, Amorites, etc.) whom the Israelites found dwelling in Canaan (Palestine) west of the Jordan, and whom later they utterly subdued, though the subjugation was not quite complete till Solomon's time. They are believed to have been, in part at least, of kindred race with the Israelites; and some authorities find traces of their descendants among the present inhabitants of Palestine.

**Canada** (kan'a-da), DOMINION OF, an immense region comprising the northern part of the North American continent, with the exception of Alaska, and the greatest of Britain's colonial possessions. It includes the provinces of Ontario (formerly Upper Canada), Quebec (formerly Lower Canada), Nova Scotia, New Brunswick, British Columbia, Prince Edward Island, Manitoba, Saskatchewan and Alberta, also the extensive territories of Yukon and Mackenzie, Keewatin and Ungava, in the bleak northern section. The Dominion embraces the whole of British North America, with the exception of Newfoundland and the coastal region of Ungava or the Labrador peninsula (which belongs to Newfoundland), and its area is not much less than that of Europe. The following table shows the present areas of the provinces of the Dominion (some of which have recently had their boundaries altered), with their populations:

| Provinces. | Area sq. m. | Population. |
|---|---|---|
| Alberta | 255,540 | 374,663 |
| British Columbia | 355,855 | 392,480 |
| Manitoba | 251,832 | 455,614 |
| New Brunswick | 27,985 | 351,889 |
| Nova Scotia | 21,428 | 492,338 |
| Ontario | 407,262 | 2,523,274 |
| Prince Edward Island | 2,184 | 93,728 |
| Quebec | 706,834 | 2,003,232 |
| Saskatchewan | 251,700 | 492,432 |
| Yukon | 207,076 | 8,512 |
| Northwest Territories | 1,242,224 | 18,481 |
| Totals | 3,729,920 | 7,206,643 |

Nova Scotia, New Brunswick, and Prince Edward Island are called the 'Maritime Provinces,' though British Columbia, being on the Pacific, is also a maritime province. In the Northwest Territories four districts were marked out in 1882. Assiniboia, area, 89,535 sq. m.; Saskatchewan, 107,092 sq. miles; Alberta, 106,100, sq. miles; Athabasca, 104,500 sq. miles. These were reorganized in 1905 into the two present provinces of Alberta and Saskatchewan.

The boundaries of the Dominion are: the Atlantic on the east, the United States on the south, the Pacific and Alaska on the west, and the Arctic Ocean on the north.

*Coasts.*—On the east the coast-line is very irregular, being marked by deep indentations and fringed by islands. The province of Nova Scotia forms an odd peninsular projection with the Bay of Fundy between it and the mainland, while north of it is the Gulf of St. Lawrence, shut in from the Atlantic by Cape Breton Island and Newfoundland. In the gulf are the island of Anticosti and Prince Edward Island. The chief features of the north coast are the archipelago of the Arctic islands and the great opening of Hudson Bay, connected with the Atlantic by Hudson Strait, and having as its southern continuation James Bay. On the west coast are Vancouver Island, the Queen Charlotte Islands, and many others. The southern boundary is most remarkable for passing through the system of great lakes—Superior, Huron, Erie, and Ontario, between the last two of which are the Falls of Niagara, partly belonging to Canada, partly to the United States. To the Atlantic the drainage of these lakes is carried by the St. Lawrence, with which river, and the great gulf into which it expands, are connected the provinces of Ontario, Quebec, New Brunswick, Nova Scotia, and Prince Edward Island, together containing by far the greater portion of the population of the Dominion.

*Surface.*—With regard to the character of the surface, Canada may be divided roughly into three great regions: a region of woodlands and hills or undulating ground in the east, an immense region of prairies in the middle, and a mountainous forest region in the west. The chief mountain regions of the east are north and south of the St. Lawrence, and run nearly parallel to that river. On the south are the Shickshock Mountains and the Notre Dame range, the former rising to the height of 4000 ft. On the north is the Laurentian range (perhaps attaining 4000 ft.), running in a westerly direction from the Labrador coast to the Ottawa river, and forming the watershed between the rivers which flow into the St. Lawrence and those which flow into Hudson Bay. The prairie region and great wheat-producing tract extends northwest of Lake Superior to the Rocky Mountains. This is a great region of plains, with low hills in some places; it is well wooded in many parts, elsewhere bare or with an agreeable mixture of woodland and prairie. Some portions are decidedly infertile, but their area is small compared with the whole. On the Pacific slope we have a distinctly mountainous region, including the Rockies, some peaks of which attain a height of about 14,000 ft., as also the Gold and the Cascade Ranges. The highest point in Canada is seemingly Mount Logan, about 19,000 feet, in the vicinity of Mount St. Elias, in Alaska. This region, with its high mountains, deep gorges or canyons, large and rapid rivers, long and narrow lakes, great forests of gigantic trees, and its narrow fiords or inlets, differs essentially from the remainder of the country.

*Lakes and Rivers.*—The vast lake and river systems which Canada possesses of its own, or shares with the United States, give it a unique character. Everywhere in the interior are rivers and lakes. To Hudson Bay flow the Albany, Nelson, Churchill, and many other streams; to the Arctic Ocean, the Mackenzie, Coppermine, and Back or Great Fish River; to the Pacific, the Fraser, Skeena, Stickeen, etc. The basin of the St. Lawrence, with the connected lakes Superior, Huron, Michigan, Erie, and Ontario, affords a continuous waterway from the Atlantic to the interior of the continent. To this system belong the Ottawa, Gatineau, Richelieu, St. Maurice, Saguenay, and other rivers. In the prairie region and the northwest are similar great lake and river systems, formed by the Saskatchewan, Nelson, Churchill, Athabasca, and Mackenzie rivers, and the great lakes Winnipeg, Athabasca, Great Slave and Great Bear. The Saskatchewan, lying in the heart of the rich wheat-growing district, must in time prove a far more important waterway than at present. The Mackenzie and its connected lakes and rivers form the most remarkable feature of the far northwest. This river, including its tributary the Peace, has a length of perhaps 2500 miles, and drains an area of 550,000 sq. miles, or almost double that of the St. Lawrence basin. Between the Mackenzie system and Hudson Bay is a great region called from its desolate character the Barren Grounds.

*Geology and Minerals.*—As regards the geological features of Canada, great part of the Dominion north of the St. Lawrence and west of Hudson Bay is covered with archæan rocks belonging to the Laurentian system and consisting largely of granite and gneiss, with quartz-rock, schist, limestone, etc., South of the St. Lawrence, in New Brunswick and Nova Scotia, is a considerable development of Carboniferous strata.

Between the archæan rocks and the Rocky Mountains is a great area of secondary (Mesozoic) strata. In the Rocky Mountain region the archæan, palæozoic, mesozoic, and tertiary systems are represented. Canada has great mineral wealth. Iron of the best quality has been found in great abundance in Quebec, Ontario, and British Columbia. The district round Lake Superior and the upper part of Lake Huron abounds in copper and has much silver as well; and Nova Scotia, Assiniboia, Alberta, and British Columbia are rich in coal. In Nova Scotia there are a number of coal-mines worked; gold is also obtained in some quantity, as well as iron. Coal is worked in the northwest, and more extensively in British Columbia, which is also rich in iron. The most valuable mineral of the Dominion is gold, of which about $26,000,000 in value was produced in 1900. This yield had fallen off in 1910 to less than $10,000,000. Large quantities of petroleum are obtained. The chief oil district is the peninsula in the province of Ontario bounded by Lakes Erie and Huron and the river St. Clair. Other useful mineral products are salt, gypsum, phosphate of lime, slate, asbestos, plumbago, antimony, nickel, cement and building-stone.

*Animals.*—The chief wild animals (some of them represented by several species) are the deer, buffalo, musk-ox, bear, wolf, fox, otter, beaver, squirrel, raccoon, musk-rat, marten, etc. The buffalo has been exterminated as a wild animal, the few remaining specimens being kept in captivity. The largest of the deer kind are the moose and elk, which are found in New Brunswick, Nova Scotia, and the northern parts of Quebec, as well as in the far west and northwest. The woodland reindeer occurs in the north. The grizzly bear is met with in the Rocky Mountains, and the polar bear in the extreme north and northeast. Fur-bearing animals are so numerous as to have been a source of revenue to a large trading company like the Hudson Bay Co. for over two centuries. There are birds in great variety, Canada having more than 700 species altogether. They include the wild swan, wild turkey, geese and ducks of various kinds, partridges, quail, prairie-fowl, pigeon, woodcock, snipe, plover, etc.; besides eagles, hawks, owls, and many smaller birds, among which are two species of hummingbird. Except at certain seasons game of all kinds may be shot at will. The rattlesnake and other snakes occur, but are less common than in the States. The seas, lakes, and rivers, especially the Gulf of St. Lawrence and the neighboring waters, abound in almost all kinds of fish, and the fisheries are extremely valuable, employing about 80,000 people. The chief sea fish caught are cod, herring, mackerel, halibut, haddock, hake, shad, salmon, etc. The rivers and lakes abound with salmon, white-fish, bass, trout, sturgeon, maskinonge (or maskelonge), pike, pickerel etc. The seal and whale fisheries are also valuable. Lobsters and oysters are abundant and excellent.

*Vegetation.*—The forests are of great extent, and the timber trade is a great source of wealth, the annual value of the timber and forest products being over $35,000,000. In the forests grow more than sixty kinds of trees. Among the most valuable are the white and red pine, white and black spruce, maple, ash, beech, oak, walnut, butternut, chestnut, basswood, birch, cedar, etc. Over most parts of the Dominion (except in the prairie regions of the interior) good timber is found, though in the older and more closely-settled parts the forests have been largely cleared off. The forests of British Columbia produce the largest timber, the Douglas pine being the chief tree. The balsam poplar grows to an immense size on the Athabasca, Peace, and Mackenzie rivers, and even at the mouth of the last, within the Arctic Circle, trees of some size are found. The Banksian pine grows to the height of 100 feet on the southern shores of Hudson Bay, and spruce suitable for building purposes, and the tamarac or larch, extend as far north as Fort George on its east and Fort Churchill on its west shore. The sugar-maple, a forest tree attaining the height of 120 feet, flourishes in the greater part of the St. Lawrence valley up to lat. 49°, and is much valued for the sugar that is obtained from it. There are a great many varieties of wild fruits, as the wild plum, wild cherry, raspberry, service-berry, cranberry, gooseberry, strawberry, black and red currant, wild vine, blackberry, buffalo-berry, etc., and numerous wild flowers and flowering shrubs. Of the wild fruits, the raspberry, the cranberry, and the blueberry are alone important economically. There are rich pasture grasses, but they cannot be utilized in cultivation.

*Climate.*—The climate of a country of such vast extent and varied features as Canada naturally differs very much in different places, and in this respect British Columbia on the Pacific coast, and Nova Scotia and the other Atlantic regions are very dissimilar to the prairie region of the center. So different, in-

deed, is the climate of one portion of the Dominion from that of other portions that Canada has been said to present 'climates and productions similar to those of northwest and central Europe—that is, of Russia, Norway, the British Islands, Denmark, Germany, France, Holland, Belgium, Switzerland, and Northern Italy.' In Ontario and the region of the Upper St. Lawrence it may be described as temperate, although the heat in summer and the cold in winter are on the average twenty degrees greater than the corresponding seasons in Great Britain. Generally the climate of the Dominion shows considerable extremes of heat and cold, but, except in some of the coast regions, the exceeding dryness of the Canadian atmosphere makes both extremes of temperature more pleasant and healthy than similar temperatures in Britain. Apart from the portions of the Dominion that fall within the Arctic Circle, Labrador and all the country east of Hudson Bay have the most severe climate. The Pacific coast region has a decidedly moist climate. The peninsula lying between Lakes Ontario, Erie, and Huron has the finest climate, allowing of fruits, shrubs, and flowers to be grown that cannot stand the winter elsewhere. The Mackenzie River district—especially in the region of the Peace River, where the temperature throughout the year is remarkably genial—possesses a climate much less severe than one might expect, and would allow of agriculture almost to the Arctic Ocean.

*Agriculture.*—Both by soil and climate Canada is specially adapted for agriculture. Within the last few years its agricultural importance has greatly increased, and when the great prairies are brought under cultivation Canada will be one of the chief agricultural countries in the world. In general, sowing is later than in the northern parts of Europe, but the harvest is gathered earlier, a large part of it usually before the end of July, so rapid is the growth during the hot Canadian summer. The chief crops are wheat, barley, oats, rye, pease, maize, buckwheat, potatoes, turnips, mangel-wurzel, etc. Of these, wheat has become of recent years a product of the greatest importance, the fertile prairie regions east of the Rockies being specially adapted to it, the annual product reaching 231,717,000 bushels in 1913, of which about three-fourths was grown in Saskatchewan. Oats are considerably greater in quantity, the yield reaching 404,669,000 bushels. The breeds of cattle are now being much improved, partly by the introduction of high-class cattle from Britain; and cattle, horses, and sheep are exported. The total value of all exports connected with agriculture, including grain, flour, animals and animal products (as cheese, eggs, etc.), was about $140,000,000 in 1910. The province of Ontario has an agricultural college and model farm at Guelph, and there are also model farms in Quebec. Fruit-growing is now an important industry in certain localities, and large quantities of apples are exported, as well as canned and dried fruits. Peaches are grown to most advantage in the Niagara district of Ontario, where peach orchards many acres in extent are to be seen. The vine is cultivated too, and good wine is made. Pears, plums, and many kinds of berry fruits, etc., are produced in great perfection.

*Commerce.*—The trade of the Dominion is chiefly with Great Britain and the United States. About four-fifths of the whole exports are sent to these two countries, while nearly nine-tenths of the imports come from them, sometimes more than one-half being from Great Britain alone. Besides timber, animals and their produce, and agricultural products, the chief articles of export are fish, coal and other minerals, leather, and wooden goods. The total exports for 1913 were valued at $355,755,000, imports at $670,089,000. Of the exports, Great Britain received $177,982,000; the United States $167,110,382; of the imports $139,669,724 came from Great Britain, $455,322,555 from the United States. A uniform decimal system of coinage was established throughout the Dominion in 1871. The unit of account is the dollar of 100 cents, like that of the United States. The money used consists of bank bills, and gold, silver, and bronze coins, besides government notes of small denominations up to $4, the bank bills being not of lower denominations than $5. There is a uniform system of weights and measures, the Canadian standards being the same as the British imperial standards.

*Railways.*—The inland trade of Canada has been much improved by the completion of the various lines of railway, and is also greatly furthered by the extensive system of canals. Of the railways, the greatest is the Canadian Pacific Railway, running from Montreal across the whole continent to Vancouver on the Pacific coast in British Columbia; length, about 2900 miles, exclusive of branches. (See *Canadian Pacific Railway.*) The Grand Trunk Railway, which crosses the St. Lawrence at Montreal by the stupendous Victoria Tubu-

lar Bridge (with its abutments nearly 2 miles long), connects the maritime provinces and the Northeastern United States, with the western railways, and has been extended to the Pacific, under the title of the Grand Trunk Pacific. Another line extended to the same terminus is the Canadian Northern, and the completion of these two projects has now given Canada three transcontinental lines. These are being connected by cross lines through the wheat region. Another important railway is the Intercolonial Railway from Halifax the Intercolonial Railway from Halifax in Nova Scotia to Quebec. Altogether the Dominion has about 25,000 miles of railway. A railway has been built to connect Winnipeg and Regina with Port Nelson on Hudson Bay, and thus to open up a shorter route from Britain to the center of the continent than any yet existing. This route will be available only for perhaps half the year on account of the ice in Hudson Strait and Bay. From Winnipeg there is direct railway communication with the Western United States, and this town is now an important center of river navigation, steamers running up the Red River into the States, up the Assiniboine, and through Lake Winnipeg and up the Saskatchewan for 1500 miles.

*Canals.*—Some of the canals are stupendous achievements. The most important from the commercial point of view are the St. Lawrence Canals, the Welland Canal, and the Sault Sainte Marie Canal. The first named series, with an aggregate length of about 70 miles, avoids the rapids on the St. Lawrence between Montreal and Kingston on Lake Ontario, and thus affords to vessels the means of ascending to that lake (in descending vessels of 700 tons can shoot the rapids with safety); and the latter, which has a length of 27 miles, avoids the Niagara Falls and rapids, and enables vessels to ascend from Lake Ontario to Lake Erie. Both the Welland Canal and the St. Lawrence series have been enlarged and deepened so as to accommodate the increased traffic which has arisen as a result of the settlement of the northwestern provinces, and the construction of the Canadian Pacific Railway. The last canal necessary to complete the navigation of the St. Lawrence to Lake Superior is the Sault Sainte Marie Canal, avoiding the St. Mary rapids, a tumultuous descent by which Lake Superior pours its waters into Lake Huron. This, opened in 1905, is opposite the canal on the Michigan side, the two carrying an enormous traffic. Next after those mentioned, the most important of the Canadian canals is the series of locks and short artificial connections known as the Rideau Canal. It connects Lake Ontario at Kingston with the Ottawa near the city of that name. By means of these works large vessels can now sail by the St. Lawrence route from the Atlantic to the head of Lake Superior.

*Constitution, etc.*—By the Act of Confederation of 1867 the constitution of the Dominion was required to be similar in principle to that of Great Britain. There is a central federal government and separate provincial governments and legislatures. The central executive government is vested in the sovereign of Great Britain and Ireland, and is carried on by a governor-general appointed by the crown and a privy-council. The governor-general has a salary of $50,000 per annum. He is assisted by a privy-council consisting of the prime-minister and twelve other ministers or heads of departments. The legislative authority rests with a Parliament consisting of two houses, the Senate and the House of Commons. The Senate is now composed of eighty-seven members, who are nominated for life by the governor-general. Each senator must be a born or naturalized subject, thirty years of age, and possessed of real or personal property to the value of at least 4000 dollars in the province for which he is appointed. The House of Commons is elected by the people for five years, there being one member for about every 20,000 of the population. There is a uniform franchise, a vote being given to every male of twenty-one years of age, possessed of a small property qualification. Each of the provinces has a separate parliament and administration, independent in its own sphere, at the head being a lieutenant-governor appointed by the central government. Ontario, Manitoba, and British Columbia have only one chamber; the other provinces have two. There is a very perfect system of municipal government throughout the Dominion, the counties and townships having local governments or councils which regulate their local taxation. The administration of justice is based on the English model, except in Quebec province, where the old French law prevails. The only court that has jurisdiction throughout the Dominion (except the Exchequer and the Maritime Court) is the Supreme Court, the ultimate court of appeal in civil and criminal cases. In certain cases an appeal may be had to the British Privy Council. The capital of the Dominion is Ottawa, but the largest cities are

Montreal, Toronto, and Winnipeg. The Dominion revenue in 1913 was $168,690,000; the expenditure was $112,060,000; the debt $483,233,000. Canada has both a large volunteer force and a militia. The former comprises many well-equipped organizations in infantry, cavalry, and artillery. A military college for the training of officers is maintained.

*Religion and Education.*—There is no state church in the Dominion. The prevailing religion in Quebec is that of the Roman Catholic Church. In Ontario Methodists predominate, then Presbyterians, the English Church, and the Roman Catholics. Education is well attended to, being everywhere more or less under the supervision of government, and excellent free-schools being provided. In Ontario, Quebec, and Manitoba separate public schools are provided for Roman Catholics; in the other provinces the schools are non-sectarian. All the provinces except British Columbia have universities or colleges, and the provision made for higher education in general is exceptionally good, a fact which is said to have an observable influence on the tone of the periodical press.

*Literature.*—In literature proper Canada, as yet mainly occupied with its material development, has scarcely had time to produce writers of a distinctively national type of style and thought. But in poetry, fiction, philosophy, Canadian history, and descriptive narrative, there is no lack of writers who reflect the highest thought and culture of Europe. The French-Canadian literature of Lower Canada, though dependent for its inspiration and models on the literature of France, deserves notice as containing some valuable works on Canadian history and an interesting collection of essays, novels, and lyrics. Amongst the works which will give the reader some general idea of Canadian authors and their work, we may mention Lareau's *Histoire de la Littérature Canadienne*, Grant's *Picturesque Canada*, Morgan's *Bibliotheca Canadensis*, and *Canadian History and Literature* by Withrow and Adam.

*People.*—The population is increasing rapidly both naturally and by means of immigration. The population in 1901 was 5,371,051. The population for 1911 was 7,206,643. Ontario is settled principally by emigrants from Great Britain and their descendants, with considerable numbers of Germans and Americans. Since about 1897 there has been an increasing outflow of American farmers to the wheat-fields of Western Canada, which were to be had on advantageous terms. Up to 1910 this immigration totaled about 425,000, of whom 60,000 came in 1909. In 1910 a check to this inflow appeared, in the appearance of a movement back to the United States. In the province of Quebec the people are mostly French in origin, speech, and customs, being mainly descendants of the French colonists who inhabited the region before it became British. There are, besides, the Indian tribes and the Eskimos, the latter in the extreme north. The Indians are estimated to number about 130,000. They are divided into various tribes as well as larger stocks or races, such as the Tinneh or Athabascan Indians, the Thlinkets and Hydahs of British Columbia and the west coast, the Algonquins, Hurons, Iroquois, etc., of the St. Lawrence region. In the old provinces separate land allotments have been granted to the Indian population, and there the Indians have adopted a settled mode of life, and have made considerable advances in civilization. A separate department of the Canadian government exercises a general supervision over their affairs. Schools have been established among them, and they are said to learn to read and write quickly and to show some talent for music and drawing. The majority of the Indians, however, live beyond the influences of this kind of civilization, and wander over the plains of the northwest, supporting themselves by fishing and hunting, carrying their furs to the various forts or trading stations of the Hudson Bay Company. They also make a number of articles out of wood, such as dishes, shovels, etc. Their canoes are ingeniously constructed of birch bark, and are made light enough to be carried for miles by a man or woman over the roughest *portages*, or places intervening between one navigable point and another. Frequently, however, the canoe is in a single piece, made by hollowing out the stem of a tree. The dwellings or *wigwams* are of the simplest construction, consisting merely of a frame of poles covered with birch bark, with a hole in the roof to serve for a chimney, and an opening covered with a blanket to serve for a door. There are also many half-breeds of mingled white (especially French) and Indian blood. These are intelligent and industrious, and engage in agriculture and other occupations, and usually speak a sort of corrupt French patois.

*History.*—English ships were the first to reach the shores of what is now Canada. In 1497 John Cabot, sailing from Bristol, landed on the coast of

Labrador, and planted the English flag there. But it was the French navigator Jacques Cartier who first really opened up Canada for European settlers. In 1534 Cartier in a single ship sailed up the Gulf of St. Lawrence till he could see land on each side. Having returned the year following, he reached the Indian town of Hochelaga, to the height above which he gave the name of Mont Royal, now Montreal, and passed the winter at the mouth of the St. Charles, where the city of Quebec now stands. Some years later vigorous attempts at colonization were made. The Sieur de Roberval was appointed Viceroy of New France, as the newly discovered territory had been called, and under his leadership and that of Cartier two hundred colonists were landed, who, after struggling for two winters with the hardships of their situation, had eventually to return. For the next fifty years no further attempts were made in these regions, except that on the parts of the English, Martin Frobisher in 1576, and Sir Humphrey Gilbert in 1583, explored and took formal possession of Newfoundland and the adjacent coasts. In 1603 Samuel Champlain, a French naval officer, sailed up the St. Lawrence to where the city of Montreal now stands, and two years afterwards a settlement was made at Port Royal in Acadia (New Brunswick and Nova Scotia) in connection with a French fur trading company, but it was abandoned three years afterwards. At length, in 1608, a French colony under the leadership of Champlain and Des Monts settled at Quebec. Two years later another English navigator, Henry Hudson, explored the bay which bears his name. In 1627, the fur trade having made considerable development under the guidance of Champlain, Cardinal Richelieu organized the company of the Hundred Associates for the further colonization of New France; but two years after the colony received a check in the capture of Quebec and other settlements by an English expedition under Sir David Kirk. The conquests, however, were soon restored to the French, by the treaty of St. Germain-en-Laye. The growth of the colony, however, was slow. At Champlain's death in 1635 it numbered but 250 Europeans, and in 1663 was still under 2000. The most formidable foes of the colonists were the Iroquois Indians, whose enmity had been excited by Champlain, and who swarmed round the settlements, rooting up the mission stations of the French Jesuits, and pursuing the fugitives to the very walls of Quebec fort. In 1663, Colbert being at the head of affairs in France, fresh supplies of emigrants and a strong body of troops were sent out to Canada. The Iroquois found it advisable to make peace, and the soldiers, turning colonists, received grants of land under a kind of feudal tenure, their seigniors being often their former officers. Under the governorship of Count de Frontenac the explorations of Jesuit missionaries, and of the adventurers Joliet and La Salle, opened up the regions of the Mississippi and the 'Great West': but the French generally preferred an adventurous life as *coureurs de bois* and trappers to the solid pursuits of agriculture. In 1682 a new war with the Iroquois broke out, in which the colonists, at first successful, afterwards suffered severely, receiving a crushing blow in the massacre of Lachine, when 1200 Iroquois descended on the island of Montreal, fired the village of Lachine, and massacred its inhabitants.

The French colonists had scarcely recovered from this blow, which virtually reduced their dominion to the military posts along the St. Lawrence, when war broke out between France and England, involving them in a strife with the British settlers in New England. The French struck the first blow by the burning of the British settlement at Corlaer (now Schenectady) and the massacre of its inhabitants. The British colonists retaliated; but the Peace of Ryswick put an end to the war without altering the position of the parties. In 1702 a new conflict arose, terminating in 1713 with the Peace of Utrecht, by which the British obtained Acadia, Newfoundland, and the regions around Hudson Bay, France retaining Canada, Cape Breton, etc. The thirty years of peace which followed was virtually a testing period for the colonizing capacities of the two nations. The French did not altogether neglect industrial development; they laid the foundation of shipbuilding at Quebec, encouraged the fur trade and other industries; but in general their colonists lacked the qualifications for agricultural and other settled pursuits. The British colonists, on the other hand, were devoted to agriculture, and reclaimed every year great tracts of forest land. As a natural consequence their population rapidly increased, and when the final struggle began, the British colonies in America numbered three millions of prosperous inhabitants against some sixty thousand French colonists hampered by feudal tenures, commercial monopolies, and a corrupt set of officials. In 1754

DOMINION OF CANADA
AND
NEWFOUNDLAND
Scale of Miles
0 100 200 400 600
Important Towns are shown in Boldface Type.
Longitude 100° West from Greenwich
PACIFIC OCEAN
ARCTIC OCEAN
ATLANTIC OCEAN
HUDSON BAY
BAFFIN BAY
DAVIS STRAIT
BAFFIN ISLAND
GREENLAND
NEWFOUNDLAND
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANITOBA
ONTARIO
QUEBEC
NEW BRUNSWICK
NOVA SCOTIA
PRINCE EDWARD I.
YUKON TERR.
MACKENZIE
KEEWATIN
UNGAVA
Winnipeg
Toronto
Montreal
Ottawa
Quebec
Halifax
Vancouver
Victoria
Edmonton
Calgary
Regina
Saskatoon
Prince Rupert
Fort William
Port Arthur
St. John
Fredericton
Charlottetown
Sydney
Hudson Bay
James Bay
Gulf of St. Lawrence
Lake Winnipeg
Lake Superior
Lake Michigan
Lake Erie
Lake Ontario
Great Slave L.
Great Bear L.
Athabasca L.
Lake Athabasca
Lake Manitoba
Lake of the Woods
Lake Nipigon
Lake Nipissing
Lake St. John
Lake Temiscamingue
Lake Winnipegosis
Lake Dauphin
Lake Simcoe
Lake Huron
Lake St. Clair
Lake Michikan
Lake Abitibi
Lake Mistassini
Lake Kamanistiquia
Lake Timiskaming
Lake Kenogami
Lake Manouan
Lake Waswanipi
Lake Mistassibi
Lake Peribonka
Lake Chibougamau
Lake Nichicun
Lake Albanel
Lake Mistassini
Lake Kaniapiskau
Lake Petitsikapau
Lake Michikamau
Lake Melville
Lake Ashuanipi
Lake Attikamagen
Lake Manicouagan
Lake Kenogami
Lake Waswanipi
Lake Mistassibi
Lake Peribonka
Lake Chibougamau
Lake Nichicun
Lake Albanel
Lake Mistassini
Lake Kaniapiskau
Lake Petitsikapau
Lake Michikamau
Lake Melville
Lake Ashuanipi
Lake Attikamagen
Lake Manicouagan
Mackenzie R.
Yukon R.
Peace R.
Athabasca R.
Saskatchewan R.
Red R.
Assiniboine R.
Winnipeg R.
Nelson R.
Churchill R.
Severn R.
Albany R.
Moose R.
Abitibi R.
Ottawa R.
St. Lawrence R.
Saguenay R.
Richelieu R.
St. John R.
Restigouche R.
Miramichi R.
Fraser R.
Columbia R.
Thompson R.
Kootenay R.
Peace R.
Liard R.
Mackenzie R.
Yukon R.
Porcupine R.
Klondike R.
Stewart R.
Pelly R.
Lewes R.
Hudson Str.
Davis Str.
Baffin Bay
Foxe Channel
Foxe Basin
Gulf of Boothia
Gulf of Alaska
Queen Charlotte Is.
Vancouver I.
Prince of Wales I.
Banks I.
Victoria I.
Melville I.
Prince Patrick I.
Ellesmere I.
Axel Heiberg I.
Grant Land
Grinnell Land
Baffin Land
Southampton I.
Coats I.
Mansel I.
Resolution I.
Cockburn Land
Devon I.
Somerset I.
Prince of Wales I.
Boothia Pen.
King William I.
Akpatok I.
Nottingham I.
Digges I.
Salisbury I.
Cape Breton I.
Prince Edward I.
Anticosti I.
Magdalen Is.
Grand Manan I.
Campobello I.
Sable I.
Seal I.
Long I.
Vancouver I.
Queen Charlotte Is.
Graham I.
Moresby I.
Dixon Entrance
Hecate Str.
Queen Charlotte Str.
Juan de Fuca Str.
Gulf of Georgia
Strait of Georgia
Puget Sound
Gulf of Alaska
Cook Inlet
Kodiak I.
Alaska Pen.
Aleutian Is.
Bering Str.
Bering Sea
Kamchatka
Siberia
Asia
Iceland
Greenland
Labrador
Newfoundland
Ungava
Keewatin
Mackenzie
Yukon Terr.
Alaska
Washington
Oregon
California
Nevada
Utah
Wyoming
Montana
Idaho
North Dakota
South Dakota
Nebraska
Minnesota
Iowa
Michigan
Wisconsin
Illinois
Indiana
Ohio
Pennsylvania
New York
Maine
Vermont
New Hampshire
Massachusetts
Rhode Island
Connecticut
New Jersey
Maryland
Delaware
Virginia
West Virginia
Kentucky
Tennessee
North Carolina
South Carolina
Georgia
Florida
Alabama
Mississippi
Louisiana
Arkansas
Missouri
Kansas
Oklahoma
Texas
New Mexico
Arizona
Colorado
Boise
Cheyenne
Salt Lake City
Carson City
Sacramento
Portland
Seattle
Spokane
Helena
Butte
Billings
Great Falls
Missoula
Bismarck
Fargo
Duluth
Minneapolis
St. Paul
Sioux Falls
Sioux City
Omaha
Lincoln
Topeka
Wichita
Oklahoma City
Tulsa
Dallas
Houston
Austin
San Antonio
El Paso
Albuquerque
Santa Fe
Phoenix
Tucson
Denver
Pueblo
Colorado Springs
Cheyenne
Laramie
Casper
Rock Springs
Ogden
Provo
Reno
Las Vegas
Los Angeles
San Diego
San Francisco
Oakland
Sacramento
Stockton
Fresno
Bakersfield
Monterey
Santa Barbara
Long Beach
Pasadena
Riverside
San Bernardino
Chicago
Milwaukee
Detroit
Cleveland
Buffalo
Rochester
Syracuse
Albany
Utica
Binghamton
Elmira
Scranton
Pittsburgh
Philadelphia
Trenton
Newark
New York
Boston
Providence
Hartford
New Haven
Portland
Bangor
Augusta
Concord
Manchester
Burlington
Montpelier
Rutland
Springfield
Worcester
Lowell
Lawrence
Fall River
New Bedford
Cape Cod
Nantucket
Martha's Vineyard
Block I.
Long I.
Staten I.
Manhattan
Brooklyn
Queens
Bronx
Richmond
Jersey City
Hoboken
Paterson
Elizabeth
Camden
Wilmington
Dover
Baltimore
Washington
Annapolis
Richmond
Norfolk
Virginia Beach
Newport News
Hampton
Petersburg
Lynchburg
Roanoke
Charleston
Huntington
Wheeling
Parkersburg
Morgantown
Clarksburg
Fairmont
Charleston
Columbia
Greenville
Spartanburg
Anderson
Greenwood
Rock Hill
Florence
Myrtle Beach
Charleston
Savannah
Atlanta
Augusta
Macon
Columbus
Albany
Valdosta
Brunswick
Jacksonville
Miami
Tampa
St. Petersburg
Orlando
Daytona Beach
Tallahassee
Pensacola
Mobile
Montgomery
Birmingham
Huntsville
Gadsden
Tuscaloosa
Selma
Dothan
Gulfport
Biloxi
Hattiesburg
Meridian
Jackson
Vicksburg
Natchez
Greenville
Clarksdale
Tupelo
Corinth
Memphis
Nashville
Knoxville
Chattanooga
Kingsport
Bristol
Johnson City
Asheville
Charlotte
Greensboro
Winston-Salem
High Point
Durham
Raleigh
Fayetteville
Wilmington
New Bern
Goldsboro
Rocky Mount
Greenville
Kinston
Jacksonville
Morehead City
Cape Hatteras
Cape Lookout
Cape Fear
Outer Banks
Pamlico Sound
Albemarle Sound
Roanoke I.
Hatteras I.
Ocracoke I.
Bodie I.
Currituck Sound
Chesapeake Bay
Delaware Bay
Delaware R.
Susquehanna R.
Potomac R.
Rappahannock R.
York R.
James R.
Appomattox R.
Shenandoah R.
Blue Ridge Mts.
Appalachian Mts.
Alleghany Mts.
Cumberland Mts.
Great Smoky Mts.
Black Mts.
Unaka Mts.
Iron Mts.
Ozark Mts.
Ouachita Mts.
Rocky Mts.
Sierra Nevada Mts.
Cascade Mts.
Coast Ranges
Wasatch Mts.
Uinta Mts.
Bighorn Mts.
Black Hills
Big Horn Mts.
Wind River Mts.
Teton Mts.
Sawtooth Mts.
Bitterroot Mts.
Cabinet Mts.
Coeur d'Alene Mts.
Selkirk Mts.
Purcell Mts.
Monashee Mts.
Cariboo Mts.
Hazelton Mts.
Skeena Mts.
Omineca Mts.
Cassiar Mts.
Pelly Mts.
Wernecke Mts.
Ogilvie Mts.
Richardson Mts.
Franklin Mts.
Mackenzie Mts.
Nahanni Mts.
Liard Mts.
Selwyn Mts.
Logan Mts.
Kluane Mts.
St. Elias Mts.
Chugach Mts.
Alaska Range
Brooks Range
Endicott Mts.
Romanzof Mts.
Baird Mts.
Schwatka Mts.
Davidson Mts.
Ogilvie Mts.
Richardson Mts.
Franklin Mts.
Mackenzie Mts.
Nahanni Mts.
Liard Mts.
Selwyn Mts.
Logan Mts.
Kluane Mts.
St. Elias Mts.
Chugach Mts.
Alaska Range
Brooks Range
Endicott Mts.
Romanzof Mts.
Baird Mts.
Schwatka Mts.
Davidson Mts.

the French governor Du Quesne, an energetic and aggressive man, established new military posts in the Ohio valley, and seized a newly-built British stockade on the spot where Pittsburgh now stands. The French were already in occupation and had named the post Fort Du Quesne, when a force, despatched by the governor of Virginia and under the command of Colonel George Washington, arrived to take possession. They were met by a small party of French sent apparently to warn them off the ground. Washington, mistaking their intention, gave the word to fire, with the result that the French leader, Jumonville, was shot. Both sides at once prepared for war. The English government sent out two regiments under General Braddock, a brave but incapable leader, who allowed himself to be surprised and routed near the Monongahela, while marching on Fort Du Quesne at the head of over two thousand men. But an expedition against Crown Point under the leadership of General William Johnson drove the French within their intrenched camp at Ticonderoga. Now happened the incident of the expulsion of the Acadian peasants (immortalized in Longfellow's *Evangeline*), of whom about seven thousand still remained in Nova Scotia, mostly on the shores of the Bay of Fundy. Although steadily refusing to take the oath of allegiance to the British government, they were, on the whole, a peaceful and inoffensive community. But a few of the more turbulent spirits took a leading part in the Indian raids on the neighboring British settlements, and were accused, besides, of intriguing with their countrymen at Louisburg, the strong fortress of Cape Breton. On these grounds the council at Halifax resolved upon the expulsion of the whole French population, and the measure was thoroughly carried into effect, yielding some little military security at the expense of what has since been considered an example of great inhumanity. The war in America was but a portion of the great conflict in which Britain was now engaged against France—the Seven Years' War, 1756–63. The early part of the struggle was decidedly in favor of the French, whose generals Montcalm, De Levi, and St. Veran were superior in energy and ability to their opponents Loudon and Abercrombie. But when Pitt came into power in the British government in 1758 the face of affairs changed. Strong reinforcements were sent out under Wolfe, Howe, and Amherst. The fortress at Louisburg, garrisoned by over 3500 soldiers and sailors, fell before Amherst, Boscawen, and Wolfe. General Johnson took Fort Niagara; Washington planted the British flag on the ramparts of Fort Du Quesne; Amherst drove the enemy from Ticonderoga and Crown Point; and the long struggle was at length virtually ended by Wolfe's brilliant capture of Quebec on 13th Sept., 1759. The French made a stand for a year longer at Montreal; but, on 8th September, 1760, the appearance of 16,000 British before its walls forced a capitulation, by which Canada passed forever from the dominion of France.

Canada was now formally annexed to the British Empire, and in 1774 an act passed in the British Parliament (the Quebec Act) extended the bounds of the province from Labrador to the Mississippi and from the Ohio to the watershed of Hudson Bay. In 1775 the war of the American Revolution broke out, and Canada became the scene of a brief struggle between the royalists and the American colonists of New England. The war ended with the recognition of the independence of the American colonies by the Treaty of Versailles, September 3d, 1783, which detached from Canada the region between the Mississippi and the Ohio. On the other hand, thousands of American loyalists sought new homes in Canada; and a large number settled on the St. John River, and had that district erected into the separate province of New Brunswick. More than 10,000 settled in Ontario, where they received liberal grants of land. In 1791 Canada was divided into two provinces—Upper Canada or Ontario, and Lower Canada or Quebec—the latter still retaining its seigneurial tenure and French law in civil cases. In Upper Canada British law and freehold tenure were introduced. In both Upper and Lower Canada representative institutions, although not responsible government, were established. From 1812 to 1815 war having broken out between Great Britain and America, Canada was again the theater of a bloody strife, at first advantagous to the British, afterwards to the Americans. In 1837–38 the discontent of the people of Lower Canada with their system of irresponsible government took the form of a rebellion, which was repressed after a brief but sharp struggle. At the same time the failure to secure responsible government brought about an insurrection in Upper Canada under the leadership of William Lyon Mackenzie, aided subsequently by a number of American filibusters, but it was quickly suppressed by the energy of the Canadian militia. The Earl of Durham was sent out as

governor-general to settle affairs on a just and liberal basis, and made a report on the condition of Canada which is one of the historical monuments of the country. The year 1839 was distinguished by the celebrated 'Boundary Dispute' between New Brunswick and the United States. After threatening preparations on both sides the quarrel was settled in 1842 by the Ashburton Treaty, which fixed the forty-fifth parallel as the boundary-line westward from the disputed territory to the St. Lawrence, and the forty-ninth parallel from the Lake of the Woods to the Pacific, the central line of the great lakes and their connecting rivers completing the boundary. The result of the rebellion of 1837–38, and Lord Durham's report, was the reunion in 1841 of Upper and Lower Canada as one province with equal representation in the common legislature, and the practical concession on the part of the mother country of responsible government. Kingston was selected as the new seat of government, and three years afterwards Montreal. In 1848 the Parliament House at Montreal having been burned in a riot, the seat of government was removed to Toronto and Quebec, these cities holding it alternately every four years. In 1854 the Reciprocity Treaty with America was concluded, according to which there was to be free exchange of the products of sea and land, with navigation of the St. Lawrence, the St. John, and the canals, and the use of the inshore fisheries in the British waters to the Americans and of Lake Michigan to the Canadians. In the same year (1854) the bill for the secularization of the clergy reserve lands, originally amounting to one-seventh of the crown territory, and a bill for the abolition of seigneurial tenure in Lower Canada were passed. By the former act the principle of religious equality was practically established in Canada. In 1858 Ottawa was finally selected as the capital of Canada, the choice having been referred to the queen. During these years the population of Upper Canada or Ontario had been rapidly increasing, and now exceeded that of Lower Canada or Quebec by nearly 300,000. Under the old constitution, however, the two provinces had equal representation in the legislature. Hence a demand arose on the part of the Upper Canadians for representation by population. This demand was practically conceded in a scheme of federation of the British North American colonies approved of by the Canadian parliament at Quebec in 1865 and forwarded to the imperial government for approbation. In 1866 the Reciprocity Treaty with the United States having expired, the government of that country practically refused to renew it except on the most disadvantageous terms for Canada. About the same time a Fenian movement against Canada, originating in the United States, began to be heard of. Gangs of desperadoes, mostly the refuse of the civil war, collected near the frontier, and ultimately crossed, occupying some villages and plundering the neighborhood. But the prompt mustering of Canadian volunteers made the filibusters recross the frontier in some haste, to be ultimately disarmed and dispersed by United States troops.

In 1867, March 28th, the British North America act for confederation of the colonies passed the imperial parliament. It united Upper Canada or Ontario, Lower Canada or Quebec, New Brunswick, and Nova Scotia, into one territory, to be named the Dominion of Canada. Newfoundland declared against joining the confederation, but with that exception all the British territory north of the United States was gradually included within the Dominion—the Hudson Bay Company territory by purchase in 1868, British Columbia in 1871, Prince Edward Island in 1873. In 1870 an insurrection of the Red River settlers, who were under apprehensions as to how their titles to their lands might be affected by the cession of the Hudson Bay Company's rights, took place under the leadership of Louis Riel, and had to be suppressed by a military expedition under Colonel (now Viscount) Wolseley. To reassure the settlers a part of the newly-purchased territory was erected into an independent province under the name of Manitoba, the unorganized territory beyond receiving the name of the Northwestern Territory. In 1871 the Washington Treaty arranged that the fisheries of both Canada and the United States should be open to each country for the next twelve years, Canada receiving a compensation, afterwards fixed at five and a half million dollars, for the superior value of its fisheries. In 1884 considerable disaffection was caused amongst the half-breeds and Indians in the Saskatchewan and Assiniboine districts on account of the difficulty of obtaining valid titles to their lands. The discontent at length took shape in an insurrection which Louis Riel was invited to head. The rebels seized the government stores at Duck Lake and induced some of the Indian tribes to co-operate with them, with the result that a massacre of settlers took place at Frog's Lake

*Official Canadian War Records.* **"TIME'S UP. OVER YOU GO."**

A Canadian battalion going over the top to new triumphs. At the appointed hour the attacking force climbs out of the trench in three or more lines or "waves" and moves forward against the enemy's trenches across "No Man's Land."

Within a few months an expedition under General Middleton, who had under his command several thousand volunteers, suppressed the rebellion. Only the leaders were arrested. Riel was tried and executed at Regina on July 28, 1885. On November 7 of the same year the Canadian Pacific Railway (which see) was completed. After 1885, when the Washington Treaty expired, disputes between the American and Canadian fishermen again became frequent, and several American fishing vessels were seized on the British North American coasts. For the adjustment of the differences connected with the fisheries a joint British and American commission was instituted in 1887. A treaty was signed in February, 1888, but was rejected by the U. S. Senate. In 1887 another arbitration board was appointed to settle a dispute with the United States concerning the Bering Sea seal fisheries, and ten years later made an award in favor of the Canadians' claims. In 1910 the vexed question of the fisheries was referred by the two countries to The Hague International Tribunal. A decision was reached Sept. 7, 1910, in which, of the seven questions involved, five were settled in favor of the United States, two (but these the most important) in favor of Great Britain. Both sides were satisfied with the result and the century-old controversy was ended. The discovery of gold in the Yukon district and the rush of settlers to that region led to a controversy as to the boundary between Canada and Alaska. This was decided in 1905 in favor of the United States. Mr. Robert L. Borden, leader of the Conservatives, assumed office as Prime Minister in 1911, and the measure permitting reciprocity on trade with the United States was defeated. The growth of the Western provinces and their activity and wealth are impressive. British Columbia, Alberta, Saskatchewan and Manitoba are steadily developing their agricultural and industrial interests, and the population is being increased by immigration. In February, 1911, the Duke of Connaught was appointed Governor-General of Canada to succeed Lord Grey. When the great European War broke out in the summer of 1914, Canada sprung loyally to the support of the mother country to the extent of her resources. Steps of importance had been taken for the development of the Canadian military system during 1913 and early 1914, these providing for the organization of the government departments on a war footing, and active efforts were now made for the completion of this, the Canadian Parliament endorsing the participation of England in the European War and coming earnestly to her assistance. Two submarine boats which had been partly completed in Scotland for the Chilian government were purchased by the Dominion authorities and turned over to the Admiralty, while numerous orders-in-council were passed, these dealing with questions concerning enemy ships in Canadian waters, trade relations with Germany, establishment of prize court, the status of Teutonic subjects in Canada, and other subjects. More immediately important was the action of the Department of Militia, which at once engaged in the recruiting and training of the first contingent of troops, for which volunteers offered themselves in numbers. These were assembled at a great training camp at Valcartier, near Quebec, where the work of fitting the recruits for their coming duties went actively on. In late September these sailed from Quebec in a large number of transports, which were met at Gaspé by a convoy of ten men-of-war and safely escorted to Plymouth, England. A camp for their further training was established in Salisbury Plains, where the work of preparing them for life in the trenches was completed. The departure of this first contingent stimulated enlistment and the work of recruiting gained new impetus, the loyal young men of Canada offering their services with enthusiastic ardor. These new detachments received a provisional training during the winter near the cities and towns, where they could be better protected agalnst the rigor of a Canadian winter, while some battalions were sent at once to England for training in that country.

It was announced in Parliament in April, 1915, that the total forces raised to that time, including those sent abroad and those under training at home, reached the number of 80,353. Of these 35,320 were in the first contingent that had been sent ahead. To these were added 12,267 active militia and permanent forces, making a total of 101,500. Up to the end of 1915 the total number sent abroad footed up 80,250, of whom 50,000 were in active duty in the trenches. In the 1916 session of Parliament, the Premier announced to Parliament the government's authorization of a Canadian army of 500,000, including those who had already crossed the ocean. The Canadian Government assumed all the cost of taking care of these forces, both at home and abroad, and as the cost of maintaining this army averaged $1000 per year for each soldier, the expense was very heavy for a population of seven or eight million people. Yet this great burden was assumed with alacrity, though the demands upon the generosity of the people were continuous and press-

ing. The citizens at home took upon themselves the charge of meeting the necessities of those whose subsistence had depended upon those now at the front. When the fund for this purpose began to show signs of depletion, a further appeal was made to the people in early 1916, and in this most of the cities, towns and villages exceeded their quota, more than $15,000,000 being raised in a few days.

As regards the troops at the front, the Canadian contingent of the British Army must be credited with doing splendid work, many perilous enterprises being intrusted to it and carried through with a dash and brilliant boldness and success that won the admiration of the world.

The Canadian home government had strenuous work to perform in meeting the claims made upon it during the war. The total revenue for the year 1915 was estimated at $170,000,000, while the increased expenditure due to the war caused the outgo to go far beyond that sum. In order to meet this and the much larger deficit anticipated for the coming period, the Minister of Finance proposed to increase the customs duties upon articles imported into Canada, the income being 7½ per cent. *ad valorem* to the general and intermediate tariffs and 5 per cent. to the British preferential tariff. Wheat, flour, anthracite coal, and some other necessary articles being exempted from these duties. In addition, various direct taxes were imposed, such as ¼ of 1 per cent. on bank notes; 1 per cent. on gross incomes of loan and trust companies; on some classes of insurance companies; on telegraph and cable dispatches; and on railway and steamship tickets; 5 cents on a ticket within from 1 to 5 dollars and 5 cents for each additional 5 dollars in value; 10 cents on railway berth tickets. Other taxes called for a 2 cent tax on checks, bills of exchange, bank receipts, post office money orders and express money orders, and 1 cent additional on each letter or postal card posted in Canada. There were also taxes on wines, on proprietary and patent medicines and perfumes and on various other articles of daily use. By the proceeds from the above and other taxes not here enumerated, it was hoped to meet a considerable part of the necessary expenses arising from Canada's participation in the war.

**Canada Hemp,** a perennial herb, *Apocynum cannabinum*, of the dogbane family, native of North America. It has a strong fiber used by Indians for twine, nets, etc.

**Canada Rice** (*Zizania aquatica*), a floating grass growing in lakes and sluggish streams in Canada and the Northern United States, yielding a grain that forms part of the food of the Indians, and is eaten by whites also.

**Canadian Balsam,** a turpentine obtained from the tree *Abies balsamea*.

**Canadian Pacific Railway,** was incorporated by Act of Parliament of Canada, and by royal letters patent, embracing contract and charter to carry out the obligation assumed by the Dominion Government on the admission of British Columbia into union with the Dominion of Canada, to connect the seaboard of British Columbia with the railway system of Canada. Subsidy, $25,000,000, and 25,000,000 acres of land, and 713 miles of complete railways. The chief movers in the scheme were Lord Mountstephen and Lord Strathcona. Its main line runs from Montreal to Vancouver, B. C., with extensions to Quebec, St. John, N. B., Toronto, Niagara and through the Minneapolis, St. Paul and Sault Ste. Marie, and Duluth, South Shore and Atlantic Railroads, which it controls, to Minneapolis, St. Paul and Duluth, and Chicago. On June 30, 1912, the company owned and leased 10,983 miles, and controlled in addition the Minneapolis, St. Paul and Sault Ste. Marie Railroad, 3773 miles, the Duluth, South Shore and Atlantic Railroad, 623 miles, and 850 miles of shorter and less important railways. In 1913 the company owned, leased or controlled 16,229 miles of railway in Canada and the United States. It also has its own telegraph system, hotels, elevators, and steamships. The railroad company is also the owner of an enormous stretch of valuable land (11,056,529 acres). The dividend paid has been 5 per cent. on the common stock from 1899 to 1902, 5½ per cent. for 1903, 6 per cent. from 1904 onward to 1909, and 6½ per cent. for 1910, with an addition of 1 per cent. per annum out of the interest on the proceeds of land sales since 1907. Since 1911 the common stock dividend has been 7 per cent. plus a 3 per cent. bonus from land sales. The capital stock of the company amounts to $260,000,000, in addition to guaranteed bonds and debenture stock, the total on June 30, 1912, being $440,207,437. The Canadian Pacific Railway owns 1820 locomotives, 2237 passenger coaches, 61,646 freight vehicles, and 5367 service vehicles.

**Canadian River,** a river of the United States, in New Mexico, Texas and Indian Territory, a tributary of the Arkansas; length, 900 miles.

**Canal** (ka-nal'), an artificial watercourse for the transportation of goods or passengers by boats or

ships, or for purposes of drainage or irrigation. The canals most familiar to ordinary readers are for navigation. These consist usually of a number of different sections, each on one level throughout its course, but differing in relative height from the others. From one section to another boats are transferred by means of *locks*, or in fewer cases by *inclines* or *lifts*. The lock is a water-tight inclosure with gates at either end, constructed between two successive sections of a canal. When a vessel is descending, water is let into the lock till it is on a level with the higher water, and thus permits the vessel to enter; the upper gates are then closed, and by the lower gates being gradually opened, the water in the lock falls to the level of the lower water, and the vessel passes out. In ascending the operation is reversed. The *incline* conveys the vessel from one reach to another, generally on a specially-constructed carriage running on rails, by means of drums and cables. The *lift* consists of two counterbalancing troughs, one going up as the other descends, carrying the vessel from the higher to the lower level, or *vice versa*. The lock was not invented until the 15th century, both the Dutch and the Italians claiming the honor. The ship canals of the world are twelve in number, viz: the Suez Canal, completed 1869; the Cronstadt and St. Petersburg, 1890; the Corinth, 1893; the Manchester, 1894; the Kaiser Wilhelm, 1895; the Elbe and Trave, 1900; the Welland, connecting Lake Erie with Lake Ontario; the two canals, United States and Canadian, connecting Lake Superior with Lake Huron; the Panama and the Cape Cod Canal. Other navigable canals, not strictly ship canals, are found in all parts of the civilized world. In England there are 3050 miles of canals; in Ireland 609; in Scotland, 154. In France there are about 3000 miles of canals, notable among this class of waterways being the Languedoc Canal or Canal des deux Mers, 148 miles long, which rises by locks to 600 feet at Naurouse and descends to Narbonne on the Gulf of Lyons, the number of locks being 119. Belgium occupies a prominent place in the provision of inland navigation, its navigable waterways totaling 1360 miles. The canals of the United States are over 50 in number, with an aggregate length of over 2600 miles. The most important are the Erie Canal, 387 miles long, 72 locks, depth 7 feet; the Ohio Canal, 317 miles long, 150 locks, 4 feet deep; the Miami and Erie Canal, 274 miles long, 93 locks, 5½ feet deep; the Pennsylvania Canal, The Chesapeake and Ohio Canal, and others. In Canada there is the Welland Canal, uniting Lakes Erie and Ontario, and avoiding the Niagara river and its fall; and there are also other important canals. In the United States the most expensive canal is the New York State Barge Canal, replacing and extending the Erie, at a cost of $75,000,000. The various canals in the United States have combinedly cost $200,000,000, about half the cost of the waterway at Panama. The object of an irrigation canal is to lead the waters of a river, flowing through a dry country, on to lands at a distance from the river bank, and so increase their fertility. Considerable tracts of the Lower Nile Valley and the rice crops of India are largely dependent upon the supply of water conveyed by irrrigation canals; and an important irrigation works have been carried out in Italy and Spain, as also in the western part of the United States. These canals are made with a regular fall or slope. By increasing the fall, the size of the channel may be proportionately reduced for a given discharge but it is inexpedient to augment the fall, even if practicable, beyond the limit at which the increased velocity of flow thereby induced begins to scour the bed of the channel.

**Canal Zone,** the territory immediately surrounding the Panama Canal, ceded by Panama to the United States in February, 1904, in return for a payment of $10,000,000 and an annual rental of $250,000. It consists of a strip of land 47 miles long and 10 miles wide, extending five miles on either side of the Panama Canal, excluding the cities of Colon and Panama. Colonel George W. Goethals, the builder of the Canal, was appointed the first governor.

**Canal Dover,** a village of Tuscarawas Co., Ohio, on the Ohio Canal, 100 miles N. of Marietta. It has iron furnaces and rolling mills, tanneries, flour mills, etc. Pop. 6621.

**Canalejas** (kä-nä-lā-häs), José Y Mendes, a Spanish statesman, born in 1850; assassinated in 1912. His public career began with his election to the Cortes in 1875, and after serving in various capacities he became Minister of Agriculture (1902), President of the Cortes (1906), and Premier of Spain (1910). It was his purpose to modernize Spain, and to that end he opposed the political and educational powers of the religious orders.

**Canaletto** (kä-nä-let'ō), the name of two prominent persons. —1. A Venetian painter, born in 1697; died in 1768. He is chiefly celebrated for his pictures of Venice.—2. His nephew, Bernardo Belotto, born in

1724, who was likewise a good artist, lived in Dresden, where he was a member of the Academy of Painters, and died at Warsaw in 1780. The Canaletti developed the pictorial treatment of architecture to a very high point.

**Canandaigua** (kan-a n-d ā'g w a), a town and lake of New York. The town stands at the n ɔrthern extremity and outlet of the lake, 28 miles S. E. of Rochester, on an elevated site which gives it a beautiful outlook over the lake. The latter is 15 miles long and 1 mile wide and is navigated by steamboats. Canandaigua has various collegiate institutions, lunatic and orphan asylums, and manufactures of agricultural implements, tinware, enamelware, pressed bricks, etc. Pop. 7217.

**Cananore** (kăn'a-nōr), a seaport town, Hindustan, Malabar district, presidency of Madras, chief military station of the British in Malabar. Pop. 27,811.

**Canara** (kăn'a-ra), a maritime region of Hindustan, now partly in the Madras presidency (South Canara), and partly in the Bombay presidency (North Canara), extending along the Indian Ocean for 180 miles, with a mean breadth of 40 miles. The Bombay portion has an area of 3911 and the Madras portion of 3902 square miles.

**Canarium** (kă-nā'ri-um), a genus of trees, order Amyridaceæ, natives of S. E. Asia, one species of which yields damar resin.

**Canary** (ka-nā'ri), a wine not unlike Maderia made in the Canary Islands, chiefly at Teneriffe.

**Canary-bird,** an insessorial singing bird, a kind of finch, from the Canary Islands the *Carduĕlis Canaria* or *Fringilla Canaria*. In color it varies from light to dark yellow. It is about 5 inches long. The Canary was introduced into Europe 300 or 400 years ago. A large proportion of the cage canaries are really mules, produced by the interbreeding of canaries with allied species, such as the goldfinch, siskin, linnet, bullfinch.

**Canary-flower** (*Tropæ̆olum peregrinum*), an annual climbing plant of the Indian cress family, a native of New Granada, cultivated in Europe for its showy yellow flowers.

**Canary Islands,** or CANARIES, a cluster of islands in the Atlantic, 60 or 70 miles from the N. W. coast of Africa, and belonging to Spain. They are thirteen in number, seven of which are considerable, viz. Palma, Ferro, Gomera, Teneriffe, Grand Canary, Fuerteventura, and Lanzarote, the largest and most important being Grand Canary, or Gran Canaria, about 180 miles from the African coast and 656 square miles in area. The other six are very small: Graciosa, Roca, or Rocca, Allegranza, Sta. Clara, Inferno, and Lobos. All are volcanic, rugged and mountainous, frequently presenting precipitous cliffs to the sea. The principal peak is that of Teneriffe, 12,182 feet; El Cumbre in Gran Canaria is 6650 feet. The area of the whole has been estimated at 2808 sq. miles. Their fine climate and their fertility, which owes little to cultivation, justified their ancient name of *Fortunate Islands*. There are no rivers of note, though streams are not infrequent. All the islands furnish good wine, especially Palma and Teneriffe. The exports consist of cochineal, wine, raw silk, fruits, etc. Of the Guanches, the mysterious tribe who originally inhabited these islands, we know little. The islands were discovered and conquered by the Spaniards between 1316 and 1334; they then passed into the hands of the Portuguese, but were reconquered toward the end of the 15th century by the Spaniards, who extirpated the inhabitants, and now constitute the great bulk of the population. The fortified capital is Santa Cruz, and the city Laguna is the seat of the bishop (Roman Catholic). The Canaries form a Spanish province; pop. 358,564.

**Canary-seed,** the seed of the canary-grass (*Phalăris Canariensis*), order Graminaceæ. The seed is used as food in the Canaries, Barbary, and Italy, and is largely collected for canary-birds. It has been successfully cultivated in England and the European continent.

**Canary-wood,** the light-orange-colored wood of *Persĕa indica* and *P. Canariensis*, trees of the laurel family belonging to the Canaries and Madeira.

**Canaster** (kan-as'ter), the rush basket in which S. American tobacco was packed, and hence applied to a kind of tobacco consisting of the leaves coarsely broken for smoking.

**Canby,** EDWARD R. S., soldier, born in Kentucky about 1818, graduated at West Point in 1839. He served in the Mexican and Civil wars, rising in rank to major-general of volunteers and succeeding General Banks as commander of the S. W. department in 1864. He invested and took Mobile in April, 1865. Promoted brigadier-general in the regular army, he was sent to quiet the rebellious Modoc Indians in Oregon in 1873, and was treacherously murdered

by them in a seemingly friendly meeting.

**Cancale** (kȧn-kȧl), a seaport and bathing place of France, dep. of Ille-et-Vilaine, about 8 miles E. N. E. of St. Malo, celebrated for its oysters. Pop. 3827.

**Cancer** (kan'ser; L., a crab), in astronomy, the fourth sign in the zodiac, entered by the sun on or about the 21st of June, and quitted about the 22d of July. The constellation Cancer is no longer in the sign of Cancer, but at present occupies the place of the sign Leo.

**Cancer,** or CARCINOMA, a malignant growth or structure in some part of the human body, which can extend itself and spread to neighboring parts, and even form again after removal, and which usually causes death. Cancer is divided into *scirrhous, encephaloid, colloid,* and *epithelial cancer. Scirrhous cancer* is a hard, firm, incompressible, and nodulated mass, at first nonadherent to the skin and attended with little or no pain. On section it is smooth and glistening, and exudes, on pressure, a small quantity of milky-looking juice. *Encephaloid cancer* is a soft, elastic tumor, less circumscribed and increasing more rapidly than the preceding. It ends in a fungous, vascular ulcer, to which the term *fungus hæmatodes* has been given, and which has a great tendency to bleed. *Colloid cancer* occurs most frequently in the stomach and alimentary canal, and consists of fibers arranged so as to form *loculi,* which contain a soft, viscous matter of a yellowish, grayish, or reddish color. *Epithelial cancer,* occurring on the skin or mucous membranes, commences as a hard, little tubercle, often resembling a wart, and like the other varieties ends in an ulcer with an ichorous discharge. Cancer is often a very painful disease.

Of recent years remarkable progress has been made by European scientists and by Dr. Howard A. Kelly, of Johns Hopkins University and others, in curing cancer in its early stages by radium treatment. Actual results have been obtained, but progress is necessarily slow.

It is claimed by Dr. W. Homer Oxford of the Polyclinic Hospital, New York, and others that a drug derived from plant life, discovered two years ago by Prof. Alexander Horwitz of Cornell University, will prove a curative agent for cancer and other abnormal cellular growths. The drug is applied hypodermically, not necessarily in the cancerous section, and must be used cautiously, as the danger of reaction is present. It produces quick result and has proved effective in many cases pronounced incurable.

A new serum treatment, devised at the General Memorial Hospital, New York, has been used successfully in a number of inoperable cases, and it is believed by many physicians that this serum will supersede the use of radium and X-rays. Many surgeons claim that the obliteration of cancer by radium is only temporary and that still more malignant growths follow.

The number of deaths from cancer registered in the United States increased from 23,295 in 1904 to 49,928 in 1913. This corresponds to a rate of more than 70 per 100,000 of population in 1904 and nearly 79 per 100,000 in 1913. The death rate per 100,000 of population from cancer increased steadily during the decade, the increase amounting to 12.5 per cent. comparing the first with the last year of the decade.

**Cancer,** TROPIC OF. See *Tropics.*

**Cancer Root,** or BEECH DROP. *Epiphēgus Virginiānus,* order Orobanchaceæ, an American parasitic plant, growing on the exposed root of the beech-tree. The whole plant is brownish, spongy and of nauseous taste, powerfully astringent, and the root

**Cancrum Oris** (kan'krum or'is), a peculiar form of gangrene, or mortification of the tissues, due apparently to defective nutrition. It is attended by ulceration of the gums, loosening of the teeth, and gangrenous sores which spread rapidly, finally making a large opening in the cheek. In some cases the entire cheek has been destroyed in a few days. Fortunately this terrible disease is rare and is amenable to treatment.

**Candahar** (kȧn-dȧ-hȧr'). See *Kandahar.*

**Candareen** (kȧn'da-rēn), in Chinese money, the 100th part of a tael, which is usually about $1.25. As a weight it is equal to 5.79 grs.

**Candelabrum** (kan-de-lā'brum), an ornamental candlestick or lamp-holder, often of a branched form. Ancient candelabra frequently display much ingenious treatment in the design, presenting columns, figures, etc., and the branches from the central shaft were often numerous. In ancient times Tarentum and Ægina were famous for their elegant candelabra.

**Candia** (kan'di-a; in the Turkish language *Kirid,* from its other name *Crete*), one of the most important islands in the Mediterranean, annexed by Greece after the Balkan War. It is 81 miles from the southern extremity of the Morea and 230 from the African coast, 160 miles long, 14 to 50 broad; area, 4026

square miles. High mountains, covered with forests, run through the length of the island in several ranges. On the north side the island declines moderately to a fertile coast, provided with good harbors; on the south side steeply to a rocky shore, with few roads; and it reaches its greatest height in Psiloriti (the ancient *Ida*), 7670 feet high, and always covered with snow. Numerous springs give fertility to most of the valleys, in which, and on the declivities of the mountains, is seen a luxuriant vegetation. The air is mild; the summer is cooled by the north winds; the winter is distinguished only by showers of rain. The island might therefore supply, as formerly, a much larger population than at present with grain, wine, and oil, wool, flax, silk, and cotton, fish, honey, game, cattle, fruits, and even with metals in abundance. But agriculture is at a very low stage while education and the amenities of civilized life are almost entirely absent. The inhabitants (estimated at 1,200,000 in ancient times, or 900,000 in the time of the Venetians) now number about 309,350, of whom more than 200,000 are Christians, mostly of Greek descent. Manufactures, trade, and navigation are very insignificant. Most of the harbors are silted up. The capital, Candia, the seat of the appointed governor, has 22,231 inhabitants; Retimo, 6000; Canea, the most important place of trade, 21,000.

The early history of Candia is lost in the fables of Greek mythology, in which Saturn, Zeus, and Minos are spoken of as among its kings. At one time a republic, it became the seat of the Cilician pirates till conquered by the Romans, from whose hands it passed in 823 to the Saracens, and then to the Greeks again in 962. In 1204 the Byzantine sovereign sold it to the Venetians, who held it until the second half of the 17th century, when the Turks conquered it after a desperate struggle and the siege of the capital for no less than twenty years. Insurrections against Turkish rule have more than once occurred and a formidable one fomented by Greece in 1868 was with difficulty suppressed after a tedious conflict. Since 1884 religious difficulties have constantly arisen; these culminated in 1897, when an insurrection supported by Greece was crushed by Turkey. The powers interfered, but anarchy still reigned until 1898, when the Great Powers forced Turkey to evacuate the island, which was left under Turkish sovereignty, but put under the government of a high commissioner appointed by George of Greece. In 1909 the troops of the Powers were withdrawn. At once the strong Greek element of the population demanded annexation to Greece, while Turkey claimed her rights of dominion, and an awkward international question arose. The new Turkish government succeeded in regaining control of the island, only to lose it at the close of the Balkan War (1913).

**Candidate** (kan'di-dāt), a person who offers himself for an office, a term taken from the Latin *candidātus*, literally a person dressed in white, because, among the Romans, a man who solicited an office, such as the prætorship or consulship, appeared in a bright white garment—*toga candida*.

**Candle** (kan'dl), a solid cylindrical rod of some fatty substance, with a small bundle of loosely-twisted threads placed longitudinally in its center, used for a portable light. The chief material used for making candles is tallow, either in a pure state or in mixture with other fatty substances, as palm-oil, spermaceti, wax, etc. Paraffin candles are now made in considerable quantities also. Ordinary tallow candles are either *dipped* or *molded*. The former, generally composed of the coarser tallow, are made by attaching a number of separate wicks to a frame and dipping the whole into a cistern of melted tallow as often as may be necessary to give the candle the required thickness. Molded candles, as their name implies, are formed in molds. Among the modern improvements in its manufacture one of the most important consists in not employing all the fatty or oily substances but in decomposing them and using only the *stearin* of the former and the *palmitin* of the latter class of substances. The large wax candles used in Roman Catholic churches are plates of wax bent round a wick.

**Candleberry,** CANDLEBERRY MYRTLE, WAX MYRTLE, etc.

Candleberry or Wax-myrtle (*Myrica cerifera*).

(*Myrica cerifĕra*), a shrub, natural

order Myricaceæ, growing from 4 to 18 feet high, and common in North America, where candles are made from its drupes or berries, which are about the size of peppercorns, and covered with a greenish-white wax popularly known as bayberry tallow. The wax is collected by boiling the drupes in water and skimming off the surface. A bushel of berries yields from 4 to 5 lbs. of wax. Another plant belonging to the same genus is the sweetgale (*Myrica Gale*), which grows abundantly in bogs and marshes in Scotland—a small shrub, with leaves somewhat like the myrtle or willow, of a fragrant odor and bitter taste, and yielding an essential oil by distillation.

**Candlefish,** a sea-fish of the salmon family, the *Thaleichthys Pacificus*, frequenting the northwestern shores of America, of about the size of the smelt. It is converted by the Indians into a candle simply by passing the pith of a rush or a strip of the bark of the cypress-tree through it as a wick, when its extreme oiliness keeps the wick blazing. It is called also *Oulachon*.

**Candlemas** (kan'dl-mas), a church feast, instituted in 492 in commemoration of the presentation of Christ in the temple and of the purification of Mary. It falls on February 2, and on this day among Roman Catholics lighted candles are carried about in procession, and all candles and tapers which are to be used in the churches during the entire year are consecrated. In Scotland Candlemas is a term-day.

**Candlenut,** the nut of *Aleurites triloba*, a tree of India, the Moluccas, Pacific Islands, etc., nat. order Euphorbiaceæ. It is about the size of a walnut, and yields an oil used for food and for lamps, while the oily kernels are also strung together and lighted as torches.

**Candlish** (kand'lish), ROBERT SMITH, a Scottish divine, born at Edinburgh in 1807 and educated at Glasgow University. In 1828 he was licensed, and in 1834 transferred from Bonhill to St. George's, Edinburgh. In 1839 he threw himself into the conflict with the civil courts in the matter of congregational right of election and independent church jurisdiction in matters spiritual, and soon became, next to Chalmers, the most prominent leader of the 'non-intrusion' party and disruptionists of 1843. From the death of Chalmers till his own death in 1873 Candlish was the ruling spirit in the Free Church. In 1862 he was made principal of the New College, Edinburgh. He was the author of several popular books on religious subjects.

**Candy,** or KANDY, a city of Ceylon, near the center of the island, 72 miles N. E. of Colombo (with which it is connected by railway), in a fertile valley surrounded by finely-wooded hills. The former residence of the governor is thought one of the finest structures in Ceylon. Other noteworthy places are the Buddhist temple, sacred in the Buddhist world, the old royal cemetery, the military magazine in the center of a lake, the government brickworks, etc. Candy was formerly capital of the native kingdom of Candy. Pop. 26,522.

**Candy,** an Eastern measure of weight, varying from 560 lbs. up to above 800.

**Candy,** COMFITS, CONFECTIONS, SWEETMEATS, forms of toothsome delicacies made by means of sugars, fruits, flavoring extracts, etc.; wholesome if pure and properly made, but sometimes adulterated with indigestible or poisonous substitutes for the proper ingredients.

**Candytuft** (kan'di-tuft), the popular name of several flowers of the genus *Ibĕris*, order Cruciferæ, common in gardens; said to be named from Candia.

**Cane.** See *Bamboo*, *Rattan*, *Sugar-cane*.

**Canea** (ka-nē'a), or KHANIA, a seaport of Crete or Candia, on the N. coast, the principal mart for the commerce of the island in wax, soap, oil, silks, fruits, wool, and provisions. Pop. 21,025.

**Canebrake** (kān-brāk), a term applied to the extensive growths of a giant reed (*Rudolfia* [*Arundinaria*] *macrosperma*), which reaches a height of 20 or more feet and forms dense swamp jungles, sometimes of wide area, along the lower Mississippi, the Red, and Arkansas Rivers.

**Canella** (ka-nel'a), WHITE (*C. alba*), a tree belonging to the West Indies, growing to the height of 10 to 50 feet, with a straight stem branched only at the top. It is covered with a whitish bark, which is freed from its outward covering, dried in the shade, and brought to Europe in long quills, somewhat thicker than those of cinnamon. It is moderately warm to the taste, and is esteemed as a pleasing and aromatic bitter.

**Canephoros** (kan-e'for-os), one of the bearers of the baskets containing the implements of sacrifice in the processions of the Dionysia, Panathenea, and other ancient Grecian festivals, an office of honor much

coveted by the virgins of antiquity. The term is applied to architectural figures

Canephoros, from terra cotta in British Museum

bearing baskets on their head, sometimes improperly confounded with Caryatides.

**Canes Venatici** (kā'nēz vē-nat'i-sē; 'the hunting dogs'), a northern constellation, within the limits of which several remarkable nebulæ occur.

**Cang,** CANGUE, or KEA, the wooden collar, weighing from 50 to 60 lbs. and fitting closely round the neck, which is imposed upon many criminals in China.

**Canicatti** (kăn-i-kăt'ē), a town in Sicily, province of Girgenti, well built, and with a pop. of 24,564, mostly engaged in agriculture. There are extensive sulphur mines in its vicinity.

**Canicula** (ka-nik'ū-la), the dog-star or Sirius; hence *Canicular days*, the dog-days.

**Canidæ** (kan'i-dē), the dog family of animals.

**Canis** (kā'nis), the genus of animals to which the dog, wolf, and fox belong.

**Canis Major** ('the greater dog'), a constellation of the southern hemisphere, remarkable as containing *Sirius*, the brightest star.—CANIS MINOR ('the lesser dog') is a constellation in the northern hemisphere, immediately above Canis Major, the chief star in which is *Procyon*.

**Canister** (kan'is-ter), a small basket originally made of reeds; a tin or metal box for holding tea, coffee, etc.; metal cases for holding bullets, which burst after leaving the gun.

**Canister Shot.** Same as *Case-Shot*.

**Canker** (kan'kėr), (1) in medicine, a collection of small sloughing ulcers in the mouth, especially of children; called also water canker. (2) In horticulture, a kind of gangrenous disease to which fruit-trees especially are liable, beginning in the younger shoots and gradually extending to the trunk. (3) In farriery, a disease in horses' feet causing a discharge of fetid matter from the cleft in the middle of the frog, generally originating in a diseased thrush.

**Canker-worm,** a worm or larva destructive to trees or plants; in America specifically applied to moths and larvæ of the genus *Anisopteryx*.

**Canna** (kan'a), a genus of plants, order Marantaceæ, some species of which have fine flowers, and some from their black, hard, heavy seeds are called Indian shot.

**Cannabinaceæ** (kan-a-bi-nā'se-ē), the order of plants to which only two plants, hemp (genus *Cannabis*) and the hop, belong, closely allied to the nettle order.

**Cannæ** (kăn'nē), a town of S. Italy, province of Bari, near the mouth of the Ofanto, formerly the Aufidus, famous as the scene of the great battle in which the Romans were defeated by Hannibal (216 B. C.) with immense slaughter.

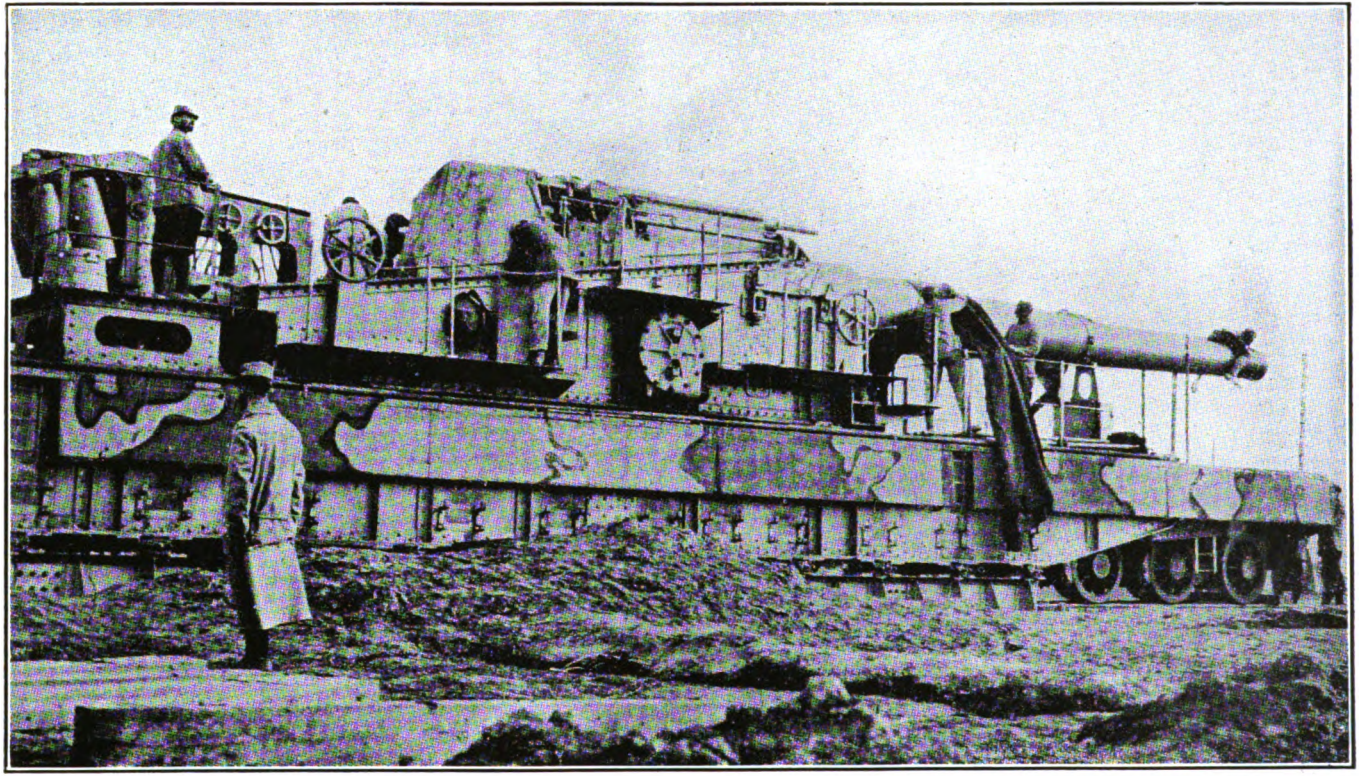
**Cannanore.** See *Cananore*.

**Cannel Coal.** See *Coal*.

**Cannes** (kăn), a seaport of France, on the shore of the Mediterranean, dep. Alpes-Maritimes; famous as a winter residence, and as the place where Napoleon landed when he returned from Elba, March 1, 1815. Pop. 29,656.

**Cannibalism** (kan'i-ba-liz'm), or ANTHROPOPHAGY, the eating of human flesh as food, a practice that has been known from the earliest times, and in the most widely spread localities, though it is now practically eradicated. See *Anthropophagi*.

**Canning** (kan'ing), CHARLES JOHN, EARL, son of George Canning, born in 1812; educated at Eton and Oxford. In 1841 he was appointed undersecretary of state for foreign affairs in Peel's government, and in 1846 commissioner of woods and forests. In the Aberdeen ministry of 1853, and under Palmerston in 1855, he held the postmaster-generalship, and in 1856 went out to India as the governor-general. Throughout the mutiny he showed a fine coolness and clear-headedness, and though



**FRENCH 370 MILLIMETER (15 INCH) GUN**

This huge piece of artillery is mounted on an ingenious railway car of enormous strength and may be rapidly moved from place to place. Its maximum range is over twenty miles and it is moved after firing a few shots to a new location to prevent the enemy getting the range and destroying it.

his carefully-pondered decisions were sometimes lacking in promptness, yet his admirable moderation did much to re-establish the British Empire in India. He was raised to the rank of earl and made viceroy, but returned to England with shattered health in 1862, dying in the same year.

**Canning,** GEORGE, a distinguished orator and statesman, born in London in 1770; educated at Eton and at Oxford. He was first brought into Parliament by Pitt in 1793, and in 1796 became undersecretary of state. In 1797 he projected, with some friends, the *Anti-Jacobin*, of which Gifford was appointed editor, and to which Canning contributed *The Knife Grinder* and other humorous poems. In 1798 he supported Wilberforce's motion for the abolition of the slave-trade. In 1807 he was appointed secretary of state for foreign affairs in the Portland administration,

George Canning.

and was slightly wounded in a duel with Lord Castlereagh, arising out of a dispute which occasioned the dissolution of the ministry. In 1810 he opposed the reference of the Catholic claims to the committee of the whole House, on the ground that no security or engagement had been offered by the Catholics, but supported in 1812 and 1813 the motion which he had opposed in 1810. In 1814 he was appointed minister to Portugal, and remained abroad about two years. He refused to take any part in the proceedings against the queen, and in 1822, having been nominated Governor-general of India, he was on the point of embarking when the death of Castlereagh called him to the cabinet as foreign secretary. One of his earliest acts in this situation was to check the French influence in Spain. He continued to support the propositions in favor of Catholic emancipation, arranged the triple alliance for the preservation of Greece, but opposed parliamentary reform and the Test and Corporation Acts. He was appointed prime minister on April 12, 1827, but his administration was terminated by his death on the 8th of August following. On all the leading political questions of his day, with two exceptions—the emancipation of the Catholics and the recognition of the South American republics—he took the high Tory side.

**Canning,** STRATFORD, VISCOUNT STRATFORD DE REDCLIFFE, an English diplomatist, son of a London merchant and cousin of George Canning, born in 1788. He entered the diplomatic service in 1807, and in 1820 became plenipotentiary at Washington. In 1824 he went as ambassador extraordinary to St. Petersburg, and afterwards to Constantinople about the Greek difficulty; but negotiations were broken off by the battle of Navarino. He was sent again to Constantinople in 1831, and to Spain in 1832, and from 1834 to 1841 sat in Parliament for King's Lynn. In 1842 he became ambassador at Constantinople, a post held by him for sixteen years under varying ministries with high honor. In 1852 he was raised to the peerage, and in 1869 created Knight of the Garter. He retired from diplomatic work in 1858, but exercised no small influence in the House of Lords, and as late as 1880 drew up a paper on the Greek claims. He died in August of that year, having done more than any other man to establish British prestige in the East.

**Canning Industry.** See *Preserved Provisions.*

**Cannock** (kan'nok), a town of England, in Staffordshire, 7½ miles N. W. of Walsall, with coal-mines, etc. Has ironworks. Pop. 28,588. Near it is Cannock Chase, a tract of 36,000 acres.

**Cannon** (kan'on), a large gun or piece of ordnance. The precise period at which engines for projecting missiles by mechanical force (catapults, etc.) were supplanted by those utilizing explosive materials is a matter of controversy, the invention of cannon being even attributed to the Chinese, from whom the Saracens may have acquired the knowledge. A doubtful authority asserts their use at the siege of Belgrade in 1073; but they were certainly brought into use in France as early as 1338. At first they were made of wood, well secured by iron hoops, the earliest shape being somewhat conical, with wide muzzles, and afterwards

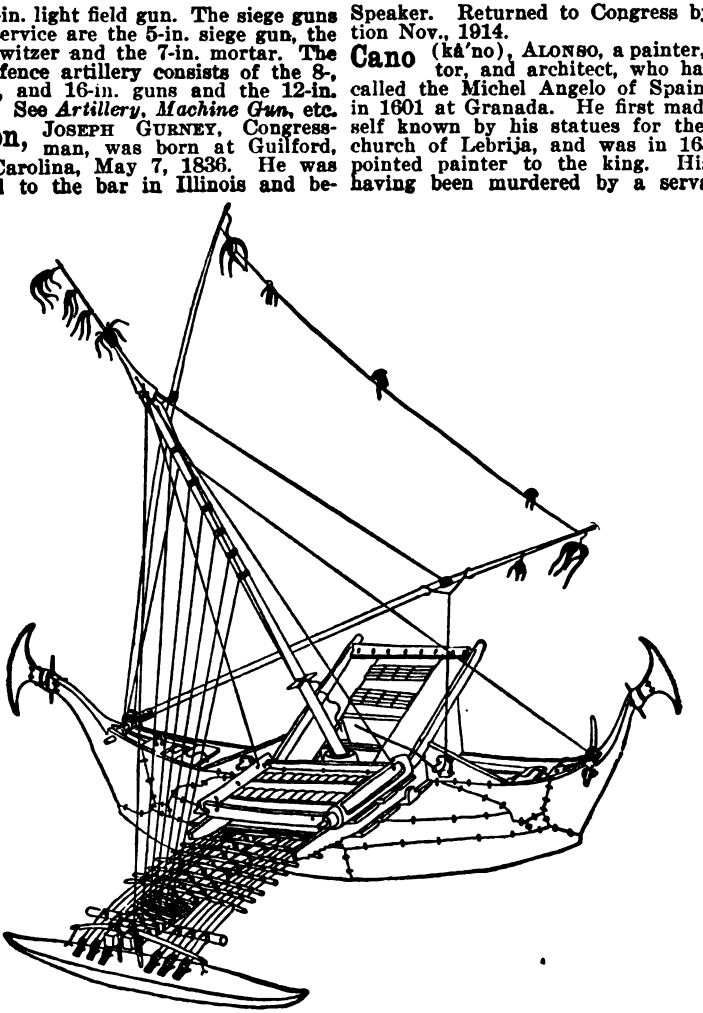
cylindrical. They were then made of iron bars firmly bound together with iron hoops like casks, Mons Meg at Edinburgh being a good example. Bronze was used in the second half of the 14th century, towards the close of which and during the 15th century cast-iron ordnance came into use. A form of breech-loading cannon was introduced in the 16th century. Cannon were formerly dignified with great names. Twelve cast by Louis XII were called after the twelve peers of France, and Charles V had twelve called after the twelve apostles. Later such names as the following came into general use: cannon royal, or carthoun, carrying 48 pounds; culverin, 18; demi-culverin, 9; falcon, 6; basilisk, 48; siren, 60, etc. Cannon were then named from the weight of the balls which they carried: 6-pounders, 12-pounders, etc.; but are now usually, especially the large ones, designated by the diameter of their bore, as a 6-, 8-, or 12-inch gun.

The heavy cannon of modern times are not cast, as was formerly the practice, but are formed of forged steel by what is known as the building-up process. The different parts are known as the *tube*, *jacket*, *hoops*, *locking rings*, *trunnion rings*, *wire* (*ribbon*) *winding*, etc. The internal stress that a cannon is subjected to is of two kinds: longitudinal stress, which acts in the direction of its length and tends to pull the muzzle away from the breech; the other kind of stress is called the circumferential or tangential stress and tends to split the gun open in lines parallel to the axis of the bore. Both of these stresses are the result of longitudinal and radial pressures of the gas engendered by the ignition of the powder. As long as projectile velocities of under 1500 feet per second were found efficient, cannon cast in one piece sufficed; but when, in order to get a greater velocity an increase in the pressure became necessary, it was found that no metal tube cast or forged would stand the strain. It was explained that the inner surface of the tube has a greater percentage of stretch than the outer surface, and this stretch decreases from the inner to the outer, and that the outer surface is not materially strained until the inner one has been strained to its elastic limit, after which the outer part gives no material assistance and further thickness is of no benefit. In an attempt to do away with this condition, cannon were constructed on the principle of varying elasticity, in which the metal with the greatest elongation within its elastic limit is placed next to the bore. This system was not found to give altogether satisfactory tests in its application to high-powered guns, and was replaced by the initial tension system, which comprises two methods: the plain built-up gun, and the wire-wrapped gun, the distinctive feature of the latter being that certain parts of the gun are wrapped with wire in the form of ribbon. It was found that the best steel forging could not be given a tensile strength within the elastic limit of much over 25 tons per square inch, and the construction of the plain built-up guns in which the jacket and chase hoops were shrunk on the tube extending the whole length of the gun, with additional hoops over the chase hoops, was modified to meet certain structural defects, and the method of wire-wrapping adopted. It is claimed for the wire-bound cannon that it insures a positive soundness of material, impossible to secure in a built-up gun; that it gives greater strength of material, hence greater tangential strength; that the initial tension can be more accurately regulated; and that it is stronger all around than the built-up gun. These advantages are in some measure negatived by certain disadvantages, one notably being a lack of rigidity in the longitudinal direction of the gun, which is not present in the built-up construction, and which tends to increase the 'droop' of the muzzle and give a certain 'whip' to the piece when fired which reduces accuracy. In consequence of this and other disadvantages the built-up guns are more generally used and are amply strong enough to stand any pressure desirable in service. In addition they are much cheaper to build than the wire-wound type. Modern heavy guns are made of medium open-hearth carbon steel, or carbon steel with about 3 per cent. nickel. The ingots for the tube, jacket and hoops are cast solid in approximately their final shape, forged in hydraulic presses or under steam hammers, annealed and then machined to final size. The tube or inner part of the piece is then placed upright in an assembling pit and the jacket and hoops are shrunk on, after which the finishing work is done and the breech mechanism fitted. Modern cannon, both military and naval types, are rifled and are breech loading. The largest guns, 16-in., are used in the U. S. Coast Defense batteries; the 16-in. gun is also used aboard recent U. S. ships of war. England has equipped several of her latest battleships with 15.5-in. guns, and other nations are following in the line of heavy armament. Military cannon are divided into three classes, according to the proportion of the length to the calibre, viz., guns, mortars and howitzers. In guns the length is relatively great, in mortars relatively small, compared to their calibres; howitzers are a class between guns and mortars. The field artillery guns of the American service are the 3.6-in. B. L. mortar, 3.6-in. heavy,

and 3.2-in. light field gun. The siege guns in the service are the 5-in. siege gun, the 7-in. howitzer and the 7-in. mortar. The coast-defence artillery consists of the 8-, 10-, 12-, and 16-in. guns and the 12-in. mortar. See *Artillery*, *Machine Gun*, etc.

**Cannon,** JOSEPH GURNEY, Congressman, was born at Guilford, North Carolina, May 7, 1836. He was admitted to the bar in Illinois and became state attorney for Vermilion Co. (1861–68), representative in Congress (1873–91), and again since 1893. Elected Speaker of the 58th Congress, he continued to hold that office until the 61st, though giving much dissatisfaction by his arbitrary and despotic rulings and his absolute control of the House. In 1909 new rules were adopted by the House which took from him much of his power. In the 62d Congress he lost his position as Speaker. Returned to Congress by election Nov., 1914.

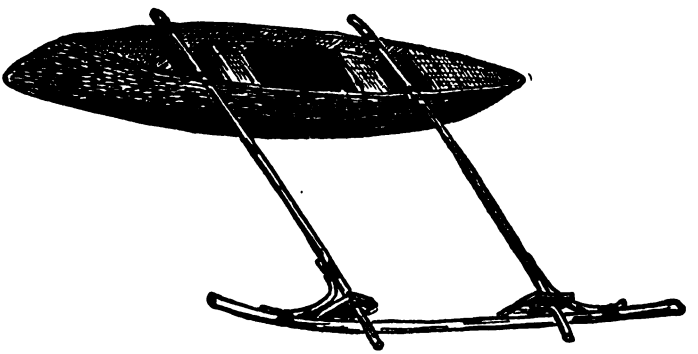
**Cano** (kä'no), ALONSO, a painter, sculptor, and architect, who has been called the Michel Angelo of Spain, born in 1601 at Granada. He first made himself known by his statues for the great church of Lebrija, and was in 1638 appointed painter to the king. His wife having been murdered by a servant or pupil, he was suspected and put to torture; but his right arm was spared from respect for his talents. He afterwards became a priest, and was made a *racionero* (resident) of Granada, where he passed the remainder of his life, dying in 1664 or 1667.



**Marshall Island Canoe or Proa.**

**Canoe** (ka-nö'; through the Spanish *canoa*, from the native West Indian name), a light boat narrow in the beam and adapted to be propelled

by paddles, often in conjunction with sails. The name was originally given to the boats of uncivilized races, but its application has been considerably extended, and canoes of home make may be seen on the waters of the most civilized countries. They are of the most diverse materials and construction. Often they are hollowed out of a single log. The Indian canoes of Canada are of bark on a wooden frame. The Eskimo *kaiaks* consist of a light wooden frame, covered with sealskins sewed together with sinews, and having only one opening to admit the boatman to his seat. In the islands of the Pacific the natives have double canoes, united by a strong platform, serving in this way as one vessel. Canvas canoes are popular among some sportsmen and canoeing is a favorite form of sport.



Native Canoe, Nukuhiva Island.

**Canon** (kan'on; Gr. *kanōn*, a rule, measure, or standard), a term given collectively to the books of the Holy Scriptures universally received as genuine by Christian churches. See *Bible, Apocrypha.*

**Canon,** a church dignitary who possesses a prebend, or revenue allotted for the performance of divine service in a cathedral or collegiate church. Canons were formerly divided into canons *regular*, or those living a monastic life, and canons *secular*, those not so living.

**Canon,** in music, a composition in which the several voices begin at fixed intervals, one after the other, and in which each successive voice sings the strain of the preceding one. Finite canons, like ordinary compositions, end with a cadence, while infinite canons are so contrived that the theme is begun again before the parts which follow are concluded.

**Cañon** (kan'yon), the Spanish word for tube, funnel, *cannon;* applied by the Spanish Americans, and hence in N. America generally (often with the spelling *canyon*), to long and narrow river gorges or deep ravines with precipitous and almost perpendicular sides occurring frequently in the Rocky Mountains, the Sierra Nevada, and great western plateaus of the United States. The greatest of these is the Grand Cañon of the Colorado, more than 300 miles long and in places 6000 feet deep. See illustration under *Arizona.*

**Canoness** (kan'on-es), a lady holding a similar position to a canon. Canonesses still exist in Germany.

**Canonical** (ka-non'-i-kal) **Hours,** certain stated times of the day appropriated by ecclesiastical law to the offices of prayer and devotion in the Roman Catholic Church, viz.: matins with lauds, prime, tierce, sext, nones, evensong or vespers, and compline.

**Canonicals** (ka-non'i-kals), the dress or vestments of the clergy.

**Canonization** (kan-on-i-zā'shun), a ceremony in the Roman Church, by which deceased persons are declared saints. The pope institutes a formal investigation of the miraculous and other qualifications of the deceased person recommended for canonization; and an *advocate of the devil*, as he is called, is appointed to assail the record of the candidate. If the examination is satisfactory, the pope pronounces the beatification of the candidate, the actual canonization generally taking

place some years afterwards, when a day is dedicated to his honor, his name inserted in the *canon* or Litany of the Saints in the Mass, and his remains preserved as holy relics.

**Canon Law,** a collection of ecclesiastical constitutions for the regulation of the Church of Rome, consisting for the most part of ordinances of general and provincial councils, decrees promulgated by the popes with the sanction of the cardinals, and decretal epistles and bulls of the popes. There is also a canon law for the regulation of the Church of England, which under certain restrictions is used in ecclesiastical courts and in the courts of the two universities. In the Roman Church these collections came into use in the 5th and 6th centuries. The chief basis of them was a translation of the decrees of the four first general councils, to which other decrees of particular synods and decretals of the popes were added. In the time of Charlemagne the collection of Dionysius the Little acquired almost the authority of laws. Some authority, also, was allowed to the spurious 9th-century collection of decretals falsely ascribed to Isidore, Bishop of Seville. After the 10th century systematical compendiums of ecclesiastical law began to be drawn from these canons, the most important being that of the Benedictine Gratian of Chiusi, finished in 1151. Within ten years after its appearance the Universities of Bologna and Paris had their professors of canon law, who taught from Gratian's work, which superseded all former chronological collections. After the appearance of the *Decretum Gratiani*, new decrees of councils and new decretals were promulgated, which were collected by Raymond of Pennaforte under the name of *Decretales Gregorii Noni* (1234); and the later decretals, etc., collected by Boniface VIII, were published as the sixth book of the Gregorian Decretals in 1298, all these having the authority of laws. Pope Clement V published a collection of his decrees in 1313. About the year 1340 the decretals of John XXII were published (*Extravagantes Johannis XXII*); and at a later period the subsequent decretals, to the time of Sextus IV (*Extravagantes Communes*) appeared. These *Extravagantes* have not altogether the authority of law. Under Pope Pius IV a commission was appointed to revise the *Decretum Gratiani*, the work being completed under Gregory XIII, and sanctioned by bull in 1580. Pope Pius X appointed a commission to revise and codify the whole body of canon law, an arduous and tedious work. The authority of the canon law in England, since the Reformation, depends upon the statute 25th Henry VIII, according to which such ecclesiastical laws as were not repugnant to the laws of the realm and the king's prerogative were to remain in force till revised. This revision was never made. A body of 141 canons was drawn up for the English church in 1603–4, and these are still partially in force, so far as concerns the clergy.

**Canopus** (kan-ō'pus), an ancient Egyptian city, between Alexandria and the western mouth of the Nile, once the chief harbor of the Delta. It had a popular temple of Serapis.

**Canopy** (kan'o-pi), a raised and ornamental covering above a throne, a bed, or the like; in architecture, a decorative structure serving as a hood or cover above an altar, pulpit, niche, etc. Also a temporary covered canvas way from a curb to a doorway, used for weddings, etc.

**Canosa** (kä-nō'za; the ancient *Canusium*), a city of South Italy, province of Bari, famous for the rock-cut tombs in its vicinity, from which many rare antiquities have been obtained, vases, weapons, ornaments, etc. Pop. 24,169.

**Canova** (kä-nō'vä), ANTONIO, an Italian sculptor, born in 1757 at Possagno in Venetian territory. He was first an apprentice to a statuary in Bassano, from whom he went to the Academy of Venice, where he had a brilliant career. In 1779 he was sent by the senate of Venice to Rome with a salary of 300 ducats, and there produced his *Theseus* and the *Slain Minotaur*. In 1783 Canova undertook the execution of the tomb of Pope Clement XIV in the Church of the Apostles, a work in the Bernini manner, and inferior to his second public monument, the tomb of Pope Clement XIII (1792) in St. Peter's. From 1783 his fame rapidly increased. He established a school for the benefit of young Venetians, and amongst other works produced his group of *Venus and Adonis*, *The Psyche and Butterfly*, a *Repentant Magdalene*, the well-known *Hebe*, the colossal *Hercules Hurling Lichas into the Sea*, the *Pugilists*, and the group of *Cupid and Psyche*. In 1796 and 1797 Canova finished the model of the celebrated tomb of the Archduchess Christina of Austria, and in 1797 made the colossal model of a statue of the King of Naples executed in marble in 1803. He afterwards executed in Rome his *Perseus with the Head of Medusa*, which, when the *Belvidere Apollo* was carried

to France, was thought not unworthy of its place and pedestal. In 1802 he was invited by Bonaparte to Paris to make the model of his colossal statue. Among the later works of the artist are a colossal *Washington*, the tombs of the *Cardinal of York* and of *Pius VII;* a *Venus Rising from the Bath;* the colossal group of *Theseus Killing the Minotaur;* the *Tomb of Alfieri:* the *Graces Rising from the Bath;* a *Dancing Girl;* a colossal *Hector;* a *Paris*, etc. After the second fall of Napoleon, in 1815, Canova was commissioned by the pope to demand the restoration of the works of art carried from Rome. He went from Paris to London, and returned to Rome in 1816, where he was made Marquis of Ischia, with a pension of 3000 scudi. He died at Venice, Oct. 13, 1822.

**Canovas del Castillo** (kå'n o-v à s dĕl kàs-tēl'-yo), ANTONIO, a Spanish statesman, born at Malaga in 1828. He became a journalist at Madrid, entered the Cortes in 1852, and was made minister of the interior. He was one of the Legitimist chiefs who called Alfonso XII to the throne of his ancestors and was prime minister of Spain, in 1874–92 and 1895. He was killed by an anarchist in 1897.

**Canrobert** (kăn-ro-bār), FRANÇOIS CERTAIN, a French marshal, born in 1809. He commanded in the Crimean war under St. Arnaud, and after the death of the latter received the chief command, but could not work in harmony with the British and made way for Pélissier. In the Italian war (1859) he commanded the 3d division, and distinguished himself at Magenta. In the Franco-German war he belonged to the force that was shut up in Metz and had to capitulate. He afterwards was a French senator. Died in 1895.

**Canso** (kan'sō), GUT or STRAIT OF, a narrow strait or channel, about 17 miles long, separating Nova Scotia from Cape Breton Island.

**Cantabile** (kan-tab'i-le), in music, a term applied to movements intended to be performed in a graceful, elegant, and melodious style.

**Cantabri** (kan'ta-bri), the rudest and most valiant of all the old Iberian tribes anciently inhabiting the northern mountains of Spain.

**Cantabrian Mountains,** the general name of the various mountain ranges extending from the Western Pyrenees along the N. coast of Spain to Cape Finisterre.

**Cantacuzenus** (kan-ta-kū-zē'nus), JOHN, a Byzantine emperor and historian, born about 1300. He was minister of Andronicus III, on whose death he became regent during the minority of John Palæologus. He defeated the Bulgarians and Turks, assumed the diadem, and entered Constantinople in triumph in 1346. After an honorable reign he retired to a monastery (1355), where he employed himself in composing a Byzantine history and other works, chiefly theological.

**Cantal** (kăn-tal), a central department in France, area 2217 square miles; capital, Aurillac. This department, formerly part of Upper Auvergne, is named from its highest mountain, the Plomb du Cantal, 6094 ft. in height. The greater part of it, occupied by the Cantal Mountains and high lands, furnishes only timber, archil, and pasture. It is watered by numerous rivers, the principal of which are the Dordogne, Cère, and Lot. The principal crops are rye, buckwheat, potatoes, and chestnuts, hemp and flax. Cattle, sheep, pigs, horses, and mules are reared in large numbers. Large quantities of cheese ('Auvergne cheese') are made. Lot mineral springs are abundant. Pop. 218,941.

**Cantaloupe** (kan'ta-lōp), a small round variety of muskmelon, globular, ribbed, of pale-green or yellow color and of deliçate flavor; first grown in Europe at the castle of Cantaloupe.

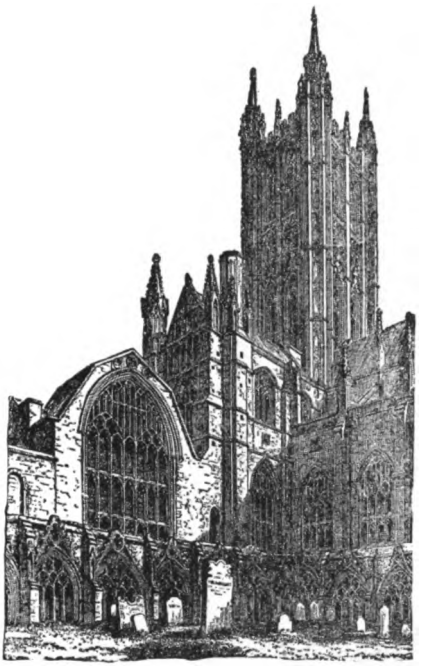
**Cantaro** (kan'ta-rō), a measure of weight and capacity; in Turkey 125 lbs., in Egypt 98 lbs., in Malta 175 lbs., etc. The Spanish wine measure cantaro is about 3½ gallons.

**Cantata** (kan-tä'ta), a vocal composition, consisting of an intermixture of air, recitative, duet, trio, quartet and chorus, often taking the form of a short oratorio or unacted opera.

**Canteen** (kan-tēn'; Ital. *cantina*, a wine-cellar), in military language, a regimental establishment managed by a committee of officers, in British barracks or forts, for the sale of liquors, tobacco, groceries, etc., to the soldiers at reasonable prices. The profits are employed for the benefit of the soldiers themselves.

**Canterbury** (kan'tĕr-ber-i), a city and municipal borough of England, in Kent, 55 miles S. E. of London, giving name to an archiepiscopal see, the occupant of which is primate of all England. The Roman name was *Durovernum*, and the place was of early importance. Its present name is a modification of the Saxon *Cant-warabyrig*, the Kentishmen's city. The foun-

dation of the archiepiscopal see took place soon after the arrival of St. Augustine in 596. In the 8th, 9th, 10th, and 11th centuries the city was dreadfully ravaged by the Danes, but at the Conquest its buildings exceeded in extent those of London. The ecclesiastical importance of the place was consummated by the murder of Thomas à Becket in the cathedral, the priory and see benefiting by the offerings of devotees and pilgrims at his shrine. Henry VIII dissolved the priory in



Chapter House and Angel Tower, Canterbury Cathedral.

1539, and ordered the bones of Becket to be burned; and the troopers of Oliver Cromwell made a stable of the cathedral —the town is beautifully situated in a fertile vale, on the river Stour. Small portions of the old walls and one of the old gates still remain. The cathedral, one of the finest ecclesiastical structures in England, 530 feet in length and 154 in breadth, has been built in different ages, the oldest part dating from about 1174 The great tower, 235 feet in height, is a splendid specimen of the Pointed style. Other ecclesiastical buildings are St. Augustine's monastery, now a church missionary college, St. Margaret's Church, and the church dedicated to St. Martin, believed to be one of the oldest existing Christian churches. The old archiepiscopal palace is now represented by a mere fragment, and the archbishops have long resided at Lambeth. Canterbury has a royal grammar-school, founded by Henry VIII, numerous other schools, art gallery, etc. There are breweries and malting establishments; and the principal articles of trade are corn and hops. There are extensive barracks for cavalry and infantry. Pop. 24,628. For *Canterbury Tales*, see *Chaucer*.

**Canterbury,** a district occupying most of the center of South Island, New Zealand, with a coast-line of 200 miles, and a greatest breadth of about 150 miles. The western part is traversed by mountains, from which a fertile plain of 2,500,000 acres slopes gradually down to the sea. Banks' Peninsula is a projection on the E. coast, consisting of an assemblage of densely-wooded hills, and containing several harbors. The famous 'Canterbury Plains,' extending along the coast, are admirably adapted for agriculture, while the interior is fine pastoral country, though, except near the highlands, very destitute of trees. Its considerable mineral resources are as yet not well developed, though some coal—of which there are large beds—is mined. The chief places in the province are Christchurch, the capital; and Lyttleton, the port town, 8 miles from Christchurch. Pop. 1901, 143,041.

**Canterbury-bell,** a name given to species of *Campanŭla, C. medium* and *C. trachelium*. See *Campanula*.

**Cantharides** (kan-thar'i-dēz), or SPANISH FLY (*Cantharis* or *Lytta vesicatoria*), a kind of beetle common in Spain, Italy, and France, having the body from 6 to 10 lines across, and of a golden-green color. It lives on trees, the leaves of which it eats. When bruised these insects are extensively used as the active element in viscatory or blistering plasters, and internally in certain cases. Their use is very dangerous, and care must be exercised even in collecting them.

**Canticles.** See *Solomon's Song*.

**Cantilever** (kan'ti-lever), that part of a beam or girder which projects like a bracket from its point of support. The brackets which

support a window balcony are cantilevers, as are also the projecting girders which carry a foot walk outside the trusses of a bridge. The principle has been widely applied in engineering, especially in bridge design. In bridges a cantilever is a girder or truss anchored to a shore abutment and resting on a second outshore pier or tower beyond which it projects. Two such cantilevers extending from opposite shores and united by a truss constitute a cantilever bridge. See *Bridge.*

**Cantire.** See *Cantyre.*

**Canto Fermo,** plain-song or choral song in unison or octave and the notes all of one length; the grave measured chant of the ancient church.

**Canton** (kan'ton), a city, capital of Stark Co., Ohio, 59 miles S. S. E. of Cleveland. It has large flour mills, enameled ware and rubber manufactories, steel and bridge works, and other industries; also a large shipping trade in coal and grain. It has Artesian well water, natural gas and a central heating plant. Pop. 50,217.

**Canton,** the metropolis of Fulton Co., Illinois, 20 miles west of Peoria. It is the center of a large coal field, with large manufacturing interests. Pop. 14,000.

**Canton** (kan-ton'; Chinese *Quang-chow-foo*), a large and important city of Southern China, 80 miles

from the sea, on the Pearl River (here about the width of the Thames at London Bridge), in the province of Quang-tung (of which name *Canton* is a corruption). The city proper is inclosed by walls 25 feet high and 20 feet thick, forming a circuit of six miles, with 12 gates; and it is divided into two parts by a wall running east and west; the larger portion north of this wall being called the old, that on the south of it the new city. The streets are long, straight, and in general paved, but very narrow, and gaudy with painted signs. The houses of the poorer classes are mere mud hovels; those of the shop-keeping class are commonly of two stories, the lower serving as the shop. The foreign mercantile houses, and the British, French, and American consulates, have as their special quarter an area in the suburbs in the southwest of the city, with water on two sides of it. In the European quarter are churches, schools, and other buildings in the European style. The river opposite the city for a space of four or five miles is crowded with boats, a large number of which—as many it is said as 40,000—are fixed residences, containing a population of 200,000. The industries of Canton are varied and important, embracing silk, cotton, porcelain, glass, paper, sugar, lackered ware, ivory carving, metal goods, etc. It was the chief foreign emporium in China until 1850, when Shanghai began to surpass and other ports to compete with it, but its exports and imports together often still amount to about $40,000,000. Since the establishment of the colony of Hong-Kong a flotilla of river steamers ply daily between Canton, Hong-Kong, and Macao. In 1856 the foreign factories were pillaged and destroyed by the Chinese, and about a year after this Canton was taken by an English force, and occupied by an English and French garrison until 1861. Pop. estimated at over 900,000.

**Cantonment,** a small division of territory constituting a distinct state or government, as in Switzerland.

**Cantonments,** the places in which troops are quartered when they are detached and distributed over a number of towns and villages, with facilities for concentration. In India the permanent military stations erected in the neighborhood of the principal cities are so called.

**Cantor** (kan'tor), the leader of the singing in a cathedral; a precentor.

**Cantu** (kän-tö'), Cesare, a popular Italian historian, born at

Brivio, near Milan, in 1805; died in 1895. For the liberal views in his *Essay on the History of Lombardy in the Seventeenth Century* he suffered a year's imprisonment. His great work is his *Universal History* (20 vols. 1837–42). He also wrote a *History of Italian Literature*, a *History of Italian Independence*, etc.

**Cantyre** (kan-tīr'), or KINTYRE, a peninsula of Scotland, between the Firth of Clyde and the Atlantic, forming the southern division of Argyleshire. It is 40 miles long from the isthmus of Tarbert to the Mull of Cantyre in the S. W., and has an average breadth of about 7 miles.

**Canute,** or CNUT (ka-nūt', knut), King of England and Denmark, succeeded his father Swegen or Sweyn on his death in England in 1014 A.D., and confirmed the Danish power in England. He began by devastating the eastern coast, and extended his ravages in the south, where, however, he failed to establish himself until after the assassination of Edmund Ironside, when he was accepted as king of the whole of England (1017). Canute, who began his reign with barbarity and crime, afterwards became a humane and wise monarch. He restored the English customs at a general assembly, and ensured to the Danes and English equal rights and equal protection of person and property, and even preferred English subjects to the most important posts. His power was confirmed by his marriage with Emma, Ethelred's widow. At Harold's death in 1018 he gained Denmark; in 1028 he conquered Norway; and in 1031 he made Malcolm of Scotland admit his superiority. Sweden also was vassal to him. He died in 1036 at Shaftesbury, leaving Norway to his eldest son, Sweyn; to the second, Harold, England; to the third, Hardicanute, Denmark.

**Canvas** (kan'vas), a coarse and strong cloth, made of flax or hemp, and used for sails, tents, etc. When prepared for portrait-painting it is classed as *kitcat*, 28 by 36 inches; *three-quarters*, 25 by 30; *half-length*, 40 by 50; *bishop's half-length*, 44 or 45 by 56; *bishop's whole length*, 58 by 94.

**Canvasback Duck** (*Fuligŭla* or *Nyrŏca vallisneria*), a bird peculiar to N. America, and considered the finest of the waterfowl for the table. It is so called from the appearance of the feathers on the back. They arrive in the United States from the north about the middle of October, sometimes assembling in immense numbers. The waters of Chesapeake Bay are a favorite locality for them. Here the wild celery, their favorite food, is abundant, and they escape the unpleasant fishy flavor of the fish-eating ducks. The plumage is black, white, chestnut-brown, and slate color; length about 20 inches.

**Canzone** (kan-tsō'nā), a kind of lyric poem in several stanzas, of Provençal origin, reduced to method in the Italian poetry of the 13th century. There are several varieties of it.

**Canzonet** (kan-tsō-nēt'), CANZONETTA, in Italian poetry a canzone with short verses, much used in the 15th century. In music, *canzonet* originally signified a short song in parts, but has often been loosely applied to any trifling air.

**Caoutchouc** (kö'chök or kou'chök), an elastic gummy substance, chemically a hydrocarbon, contained in the milky juice of a number of tropical trees of various orders, among the chief being the *Siphonia elastica* (*Hevĕa elastica*) and others of the same genus growing in South America. The name is also used as an equivalent of India rubber, but strictly caoutchouc is only the chief ingredient of India rubber. The crude India rubber is most commonly obtained by making incisions

Caoutchouc Tree (*Siphonia elastica*).

in the trunks of the trees, whence the sap exudes in the form of a milky fluid which gradually thickens and solidifies. Caoutchouc is a non-conductor of electricity and a bad conductor of heat. It is not dissolved by water, hot or cold, but chloroform, oil of turpentine, benzine, bisulphide of carbon, etc., dissolve it. It was not until about the year 1736 that India rubber was known in Europe. It was at first only used to rub out pencil-marks, but before the end of the 18th century it was used to render leather and other substances watertight, and in 1823 Macintosh took out a patent for the waterproof materials prepared with caoutchouc which bear his name. In

1834–44 Charles Goodyear, of the United States, discovered the process of vulcanizing or hardening India rubber, by mixing it with sulphur, which has rendered it applicable for a multitude of purposes. Gutta-percha is a similar substance to caoutchouc, and is often popularly confounded with it. See *India Rubber.*

**Cap,** in ships, a piece of timber placed over the head of a mast, having in it a hole to receive the top, or top-gallant-mast.

**Cap,** a covering for the head, usually of softer materials and less definite form than a hat. *Cap of maintenance,* a cap formerly worn by dukes and commanders in token of excellency, now an ornament of state carried before the sovereigns of England at their coronation, and also before the mayors of some cities.

Cap of Maintenance, from great seal of Henry VII.

**Cape Breton** (kāp bri'un or bret'-un), an island of the Dominion of Canada, separated from Nova Scotia, to which province it belongs, by the narrow Gut or Strait of Canso; area 3120 sq. miles. It is of very irregular shape, the Bras d'Or, an almost landlocked arm of the sea (with most picturesque scenery), penetrating its interior in various directions, and dividing it into two peninsulas connected by an isthmus across which a canal has been cut. The surface is rather rugged, and only small portions are suited for agriculture; but it possesses much timber, valuable minerals (several coal-mines being worked), and the coast abounds in fish. Timber, fish, and coal are exported. The island belonged to France from 1632 to 1763, and Louisburg, its capital, was long an important military post. It was separate from Nova Scotia between 1784 and 1820. Pop. 97,200. Chief town, Sydney.

**Cape Coast Castle,** a town and fort in West Africa, formerly capital of the British possessions on the Gold Coast. The fortress stands on a rock close to the sea; the town chiefly consists of mud huts, and is a place for native barter. Exports gold-dust, ivory, and palm-oil. Pop. 28,948.

**Cape Cod,** a noted peninsula of the United States on the S. side of Massachusetts Bay; 65 miles long and from 1 to 20 broad. It is mostly sandy and barren, but populous.

**Cape Cod Canal,** a ship canal cut across the narrow neck of Cape Cod to shorten the distance by water between New York and Boston and escape the perils of the outside navigation. Begun in 1909, it was completed in 1914, at a cost of about $12,000,000. The length of the canal proper is 8 miles; total length between navigable waters of suitable depth, 13 miles; depth at low water, 25 feet; minimum bottom width, 100 feet. It saves 70 miles in navigation between the two cities and an annual loss by storm wreckage of not less than half a million dollars.

**Cape Colony,** a British colony occupying the southern extremity of Africa, washed on the west, south, and east by the ocean, and bounded on the north by German territory, Bechuanaland, Orange River State, Natal, etc., the Orange River forming a great part of the boundary. Area (with dependencies), 276,995 sq. miles; population; estimated in 1910 at 2,507,500. The coast is not much indented; the principal bays are St. Helena, Saldanha, Table, False, Walker, Mossel, and Algoa. In the interior almost every variety of soil and surface is found, but a great part of the colony is arid and uninviting in appearance. Several ranges of mountains, running nearly parallel to the southern coast, divide the country into successive terraces, rising as they recede inland, between which lie belts of fertile land, or vast barren-looking plains, one of them, the Great Karroo, being 300 miles long and 100 broad. These plains make valuable sheep-walks, and the soil, where there is a sufficiency of water, is generally fertile. Irrigation, however, is greatly required, and large reservoirs have been constructed. The principal and farthest inland mountain terrace, averaging 6000 or 7000 ft. in height, commences in Namaqualand and runs to the northeast frontier. The culminating point is the Compass Berg, over 8000 ft. The Table Mountain at Cape Town rises almost perpendicularly about 3585 ft. in height. The colony is deficient in navigable rivers, and many of the streams are dry or almost so in the warm weather. The Orange is the largest, the other principal streams being Olifants River, flowing W.; the Breede, Groote, Gamtoos, emptying themselves on the S.; the Great Fish and Great Kei, on the S. E.; and the Hartebeest and the Vaal, tributaries of the Orange. The climate is very healthy and generally pleasant. Except along the coast, especially the southeast coast district, where there are extensive forests, timber is scarce, but with irrigation trees can be grown anywhere. The principal minerals are copper ore, coal, iron ore, manganese, and diamonds, amethysts, agates, etc.

Coal and copper are worked, and the diamonds have brought a great amount of money into the colony since 1869, and have given rise to the town of Kimberley, the center of the diamond-fields. Wheat, maize, and other cereals can be grown almost everywhere, if there is sufficient moisture, in some years yielding a surplus for exportation. All kinds of European vegetables, pot-herbs, and fruits thrive excellently, and fruits dried and preserved are exported. The vine is cultivated, and excellent wines are made. Sheep-rearing, especially that of pure merinoes, is the most important industry, and wool the chief export. Ostrich feathers, hides, and skins are also exported. Both native and angora goats are bred, and the export of mohair is important. Cattle-breeding is also carried on to some extent. There are as yet no manufactures of importance. The colony is intersected by 1600 miles of railway, far-inland Kimberley being now thus connected with Cape Town and Port Elizabeth. British money, weights, and measures are alone in use, except that the general land measure is the Dutch *morgen*=2.116 acres. The total imports in the year 1908 were $63,699,390; the total exports $210,557,610, made up chiefly of gold, diamonds, wool, ostrich feathers, and hides and skins. The revenue was $34,909,365; expenditure $39,868,635; the public debt $265,729,400. The European inhabitants consist in part of English and Scottish settlers and their descendants, but, notwithstanding the recent influx of settlers from Britain, the majority are still probably of Dutch origin. The colored people are chiefly Hottentots, Kaffirs, Basutos, Griquas, Malays, and a mixed race. The laborers are chiefly Hottentots and Kaffirs. For the higher education there are four colleges, besides a university (at Cape Town) incorporated in 1873. Responsible government has been possessed by the colony since 1872. The executive is vested in the governor (who is appointed by the King of England and is also commander-in-chief) and an executive council of officeholders appointed by the British government. The legislative is in the hands of a council (the Upper House); and a representative house of assembly (Lower House), elected for five years. The revenue is derived mainly from duties on goods imported. After Cape Town the chief towns are Port Elizabeth, Graham's Town, Kimberley, Stellenbosch, King William's Town, and Graaff Reinet. The Dutch first colonized the Cape in 1652, and till the end of the 18th century the colony was under the Dutch East India Company. It was held by the British from 1795–1801, and it came finally into British possession in 1806. The progress of the colony was long retarded by a series of Kaffir wars, the last of which was in 1851–53. In 1910 Cape Colony was incorporated under title of Cape of Good Hope, with the Transvaal, Orange River, and Natal colonies, into the commonwealth named the Union of South Africa (*q. v.*).

**Capefigue** (kåp-fēg), BAPTISTE HONORÉ RAYMOND, a French historian and biographer, born 1801. He held various journalistic posts in connection with the *Temps*, the *Messager*, etc., his royalist articles winning him a temporary appointment in the foreign office under the Bourbons. His numerous works include biographies and histories extending over the whole field of French history from the time of Hugh Capet to that of the Empire. He died in 1872.

**Cape Haitien** (hā'ti-en), a town on the N. coast of Haiti. It has an excellent harbor, but has declined in importance since the last century. Pop. about 30,000.

**Cape Hatteras,** a dangerous cape on the coast of North Carolina, the projecting point of a long reef of sand.

**Cape Horn,** or THE HORN, the southern extremity of an island of the same name, forming the most southerly point of South America. It is a dark, precipitous headland, 500 to 600 feet high, running far into the sea. Navigation round it is dangerous on account of frequent tempests. The cape was first doubled in 1616 by Schouten, a native of Hoorn, in Holland, whence its name.

**Capel** (kap'el), LORD ARTHUR, son of Sir Henry Capel, born about 1600; raised to the peerage by Charles I. During the parliamentary war he fought bravely as one of the royalist generals in the west in the engagements at Bristol, Exeter, and Taunton. Having been at length forced to surrender at Colchester to General Fairfax he was imprisoned, and, after some vicissitudes, executed on March 9, 1649. His *Daily Observations* or *Meditations* was published posthumously with a memoir.

**Cape May,** a popular seashore watering place at the southern end of New Jersey, 81 miles by rail S. by E. of Philadelphia, noted for its fine beach, five miles in length and almost level throughout. Pop. 2471.

**Cape Nome,** situated on the N. W. coast of Alaska, at the entrance of Norton Sound, about 2700 miles N. W. of Seattle. In July, 1899, gold was discovered on the beach. The amount of gold produced up to Jan., 1901, is estimated at over $20,000,000. Since then the yield has fallen off. Nome is the only city. Its former population of over 12,000 has decreased to 2600.

**Cape of Good Hope,** a celebrated promontory near the southern extremity of Africa, at the termination of a small peninsula extending south from Table Mountain, which overlooks Cape Town. This peninsula forms the west side of False Bay,

and on its inner coast is Simon's Bay and Simon's Town, where there is a safe anchorage and a British naval station. Bartholomew Diaz, who discovered the Cape in 1487, called it Cape of Storms; but John II of Portugal changed this to its present designation. It was first doubled by Vasco de Gama in 1497.

**Caper** (kā'per), the unopened flower-bud of a low trailing shrub (*Cappăris spinōsa*, order Caparidaceæ), which grows from the crevices of rocks and walls, and among rubbish, in the countries bordering the Mediterranean. Picked and pickled in vinegar and salt it is much used as a condiment (caper-sauce being especially the accompaniment of boiled mutton). The flower-buds of the marsh-marigold (*Caltha palustris*) and nasturtium are frequently pickled and eaten as a substitute for capers.

**Capercailzie,** OR CAPERCAIL'LIE (kap-ĕr-kāl'ye), or COCK OF THE WOOD, the wood-grouse (*Tetrāo urogallus*), the largest of the gallinaceous birds of Europe, weighing from 9 to 12 lbs. In the male the neck and head are ashy black, the wings and shoulders brown with small black dots, the breast variable green, the belly black with white spots, the rump and flanks black with zigzag lines of an ashy color, and the tail-feathers black, with small white spots near their extremities. The female, about one third smaller than the male, is striped and spotted with red or bay, black and white, and has the feathers of the head, breast, and tail of a more or less ruddy hue. It is common in N. Asia, in parts of Russia, and throughout Scandinavia. For some time it was almost or wholly extinct in Great Britain, but has been successfully reintroduced.

**Capernaum** (ka-per'nā-um), a town in ancient Palestine, on the W. side of the Sea of Tiberias. Nothing of it now remains, but the site is identified with Tel Hum.

**Cape St. Vincent,** the S. W. point of Portugal; noted for the naval victory gained off it by Sir John Jervis (afterwards Earl of St. Vincent) on February 14, 1797.

**Capet** (kā-pet), the name of the French race of kings which has given 118 sovereigns to Europe, viz., 36 kings of France, 22 kings of Portugal, 11 of Naples and Sicily, 5 of Spain, 3 of Hungary, 3 emperors of Constantinople, 3 kings of Navarre, 17 dukes of Burgundy, 12 dukes of Brittany, 2 dukes of Lorraine, and 4 dukes of Parma. The first of the Capets known in history was Robert the Strong, a Saxon made Count of Anjou by Charles the Bold, and afterwards duke of the Ile de France. His descendant, Hugh, son of Hugh the Great, was in 987 elected King of France, succeeding the Carlovingian dynasty. On the failure of the direct line at the death of Charles IV the French throne was kept in the family by the accession of the indirect line of Valois, and in 1589 by that of Bourbon. Capet being thus regarded as the family name of the Kings of France, Louis XVI was arraigned before the National Convention under the name of Louis Capet

**Cape Town,** capital of the Cape Colony, S. Africa, at the head of Table Bay, and at the base of Table Mountain, 30 miles from the Cape of Good Hope. It is regularly laid out and furnished with most of the institutions and conveniences of a European town, has a fine public library and museum, a Roman Catholic and an Anglican cathedral, new and handsome houses of Parliament, government offices, a university, a botanic garden, an observatory, townhouse, exchange, railway station, etc. The port has a breakwater 2000 feet long, two docks 16 acres in area, and a large graving-dock. Besides the railway going inland, a railway connects the town with Simon's Town on False Bay. Population including suburbs, 149,461.

**Cape Tulip.** See *Blood-flower.*

**Cape Verde** (verd), the extreme W. point of Africa, between the Senegal and the Gambia, discovered by Fernandez, 1445.

**Cape Verde Islands,** a group of ten or fifteen volcanic islands and rocks in the Atlantic, 320 miles west of Cape Verde (see above), belonging to Portugal. They are, in general, mountainous, and the lower hills are in many places covered with verdure; but water is scarce, and the failure of the annual rains has sometimes caused severe famines. They produce rice, maize, coffee, tobacco, the sugar-cane, physic-nuts, and various fruits. Coffee, hides, archil, physic-nuts, etc., are exported. Most of the inhabitants are negroes or of mixed race. The chief town is Praia, a seaport on São Thiago (Santiago), the largest island. Porto Grande, on São Vicente, is a coaling station for steamers. Pop. 147,424.

**Cape Wrath,** the northwest extremity of Scotland, county Sutherland. It is a pyramid of gneiss bearing a lighthouse, the light of which is 400 ft. above sea-level.

**Capgrave** (kap'grāv), JOHN, an English historian, born at Lynn, Norfolk, April 21, 1393. Most of his life was passed in the Augustinian friary of his native place, where he died in 1464. He was one of the most learned men of his day, and wrote numerous commentaries, sermons, and lives of the saints. His most important work was his *Chronicle of England*, in English, extending from the creation to the year 1417. Other works were a *Liber de Illustribus Henricis* and a *Life of St. Katherine.*

**Capias** (kā'pi-as; L., take, or you may take), in law, a writ of two sorts: one before judgment, called a *capias ad respondendum*, to take the defendant and make him answer to the plaintiff; the other, which issues after judgment, of divers kinds; as, a *capias ad satisfaciendum*, or writ of execution.

**Capillaries** (kap'i-lar-iz), in anatomy, the fine blood-vessels which form the links of connection between the extremities of the arteries and the beginnings of the veins, and from which the tissues of the body receive their nourishment.

**Capillarity** (kap-i-lar'i-ti), the general name for certain phenomena exhibited by fluid surfaces when the vessels containing the liquid are very narrow, and also exhibited by that portion of the fluid surface which is in close proximity to the sides of a larger vessel or to any inserted object. Thus, if an open tube of small bore be inserted in water, it will be noted that the liquid rises within it above its former level to a height varying inversely as the diameter of the bore, and that the surface of this column is more or less concave in form (as in Fig. 1). The same phenomenon occurs in

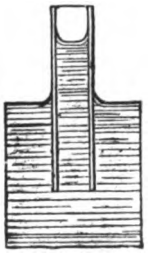


Fig. 1.

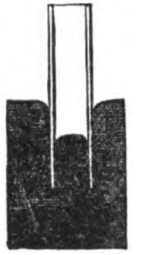


Fig. 2.

any fluid which will wet the tube; but in the case of a fluid like mercury, which does not wet the glass, the converse phenomenon appears, the liquid being depressed in the tube below its former level, and the portion within the tube exhibiting a convex surface (see Fig. 2). Similarly round the sides of the respective vessels, and round the outsides of the inserted tubes, we find in the first case an ascension, and in the second a depression of the liquid, with a corresponding concavity or convexity at its extreme edge. Two parallel plates immersed in the liquids give kindred results. As these phenomena occur equally in air and *in vacuo* they cannot be attributed to the action of the atmosphere,

but depend upon molecular actions taking place between the particles of the liquid itself and between the liquid and the solid, these actions being confined to a very thin layer forming the superficial boundary of the fluid. Every liquid, in fact, behaves as if a thin film in a state of tension formed its external layer; and although the theory that such tension really exists in the superficial layer must be regarded as a scientific fiction, yet it adequately represents the effects of the real cause, whatever that may be. Scientific calculations with respect to capillary depressions and elevations proceed, therefore, on the working theory that the superficial film at the free surface is to be regarded as pressing the liquid inwards, or pulling it outwards according as the surface is convex or concave—the convex or concave film being known as the *meniscus* (crescent). The part which capillarity plays among natural phenomena is a very varied one. By it the fluids circulate in the porous tissues of animal bodies; the sap rises in plants, and moisture is absorbed from air and soil by the foliage and roots. For the same reason a sponge or lump of sugar, or a piece of blotting-paper soaks in moisture, the oil rises in the wick of a lamp, etc.

**Capital** (kap'i-tal), in trade, the term applied, as the equivalent of 'stock,' to the money, or property convertible into money, used by a producer or trader for carrying on his business; in political economy, that portion of the produce of former labor which is reserved from consumption for employment in the further production of wealth—the apparatus of production. It is commonly divided under two main heads—circulating capital and fixed capital. Circulating capital comprises those forms of capital which require renewal after every use in production, being consumed (absorbed or transformed) in the single use, *e.g.* raw materials and wages. Fixed capital, on the other hand, comprises every form of capital which is capable of use in a series of similar productive acts, *e. g.*, machinery, tools, etc. From the ordinary economic point of view capital is conveniently limited to material objects directly employed in the reproduction of material wealth, but from the higher social point of view many things less immediately concerned in productive work may be regarded as capital. Thus, Adam Smith includes in the fixed capital of a country, 'the acquired and useful abilities of all the inhabitants;' and the wealth sunk in prisons, educational institutions, etc., plays ultimately a scarcely less important part in production than that invested in directly productive machinery.

**Capital,** an architectural term, usually restricted to the upper portion of a column, the part resting immediately on the shaft. In classic architecture each order has its distinctive capital, but in Egyptian, Indian, Saracenic, Norman, and Gothic they are much diversified. See *Column*.

**Capital,** the chief city of a state or county, the seat of government.

**Capital Punishment,** in criminal law, the punishment by death. Formerly in many countries it was the ordinary form of punishment for felonies of all kinds; but a more accurate knowledge of the nature and remedies of crime, a more discriminating sense of degrees in criminality, and an increased regard for human life later tended to restrict, if not to abolish, the employment of the penalty of death. The improvement in the penal laws of Europe in this respect may be traced in large part to the publication of Beccaria's treatise on crimes and punishments (*Dei Delitti e delle Pene*) in 1764. At that time in England, as Blackstone a year later pointed out with some amount of feeling, there were 160 capital offences in the statute book. The work of practical reform was initiated in 1770 by Sir William Meredith, who moved for a committee of inquiry into the state of the criminal laws; but the modifications secured by it were few, owing to the opposition of the House of Lords, which contiuued down to 1832 to oppose systematically all attempts at criminal law reform. In the year of the passage of the Reform Bill (1832) forty kinds of forgery with many less serious offences were still capital, though from that time the amelioration was rapid. In several other European countries—Sweden, Denmark, North Germany, Bavaria, Austria—there is even a greater unwillingness to enforce capital punishment than is found in Great Britain, though the penalty remains upon the statute books. In Belgium there has been no execution since 1863. In Switzerland capital punishment was abolished in 1874, and though the right of restoring it was allowed to each canton in consequence of an increase of murders, only 7 out of a total 22 have availed themselves of it. In Roumania it was abolished in 1864; in Holland in 1870; and it has also been discontinued in Portugal. In several of the states of America—Michigan, Wisconsin, Rhode Island, and Maine, im-

prisonment for life has been substituted for murder in the first degree; in the remainder capital punishment is retained, though the experiment of its abolition was made for a short time in New York and Iowa.

The manner of inflicting the punishment of death has varied greatly. Barbarous nations are generally inclined to severe and vindictive punishments; and even in civilized countries, in cases of a political nature, or of very great atrocity, the punishment has been sometimes inflicted with many horrible accompaniments, such as tearing the criminal to pieces, starving him to death, breaking his limbs upon the wheel, pressing him to death in a slow and lingering manner, burning him at the stake, crucifixion, etc. In modern times amongst civilized nations, public opinion is strongly disposed to discountenance the punishment of death by any but simple means; and even in governments where torture is still countenanced by the laws it is rarely or never resorted to. In Great Britain and in most parts of the United States the method of execution is by hanging. In Germany and France the sword and the guillotine are the usual means; in Spain, strangulation by means of the *garrote*, a sort of iron collar tightened by a screw. Of late some tendency has been shown to adopt electricity as the means of death, and in New York and some other states it has been formally adopted. Capital punishment cannot be inflicted, by the general humanity of the laws of modern nations, upon persons who are insane or who are pregnant, until the latter are delivered and the former become sane. In military law, sentence of death may be passed for various offenses, such as sedition, violence and gross neglect of duty, desertion, assault upon superior officers, disobedience to lawful commands, etc.

**Capitals,** the large letters used in writing and printing, most commonly as the initial letters of certain words. As among the ancient Greeks and Romans, so also in the early part of the middle ages, all books were written without any distinction in the kind of letters, large letters (capitals) being the only ones used; but gradually the practice became common of beginning a book, subsequently, also, the chief divisions and sections of a book, with a large capital letter, usually illuminated and otherwise richly ornamented. Proper names are always begun with capitals. In German nouns are always capitalized. Abbreviated proper names consist of a capital letter, the first of each word, and a period, and are called initials. Two, three or four line initials are used at beginnings of chapters of books, etc., named according to the number of lines of type beside which they extend. There is a great diversity in capitalization.

**Capitanata.** See *Foggia.*

**Capitanis** (kap-i-tā'niz), the hereditary chieftains of certain bands of Christian warriors who, about the beginning of the 16th century, retired to the mountain fastnesses of Northern Greece, where they maintained a kind of independence of the Turkish government, and supported themselves by predatory incursions on the neighboring provinces. The Turks tried to organize them as a paid police, but with imperfect success; and in the struggle for Greek independence they not only formed an insurgent body of about 12,000 men, but furnished most of the Greek generals of that period—Odysseus, Karatasso, Marco Bozzaris, etc.

**Capitation-tax** (kap-i-tā'shun), a tax or impost upon each head or person. A tax of this kind existed among the Romans, but was first levied in England in 1380, occasioning the rebellion under Wat Tyler. It was again levied in 1513, and by Charles II in 1667, and abolished 1689. Many of the states of the United States have a poll-tax paying electorate.

**Capitol** (kap'i-tol), now *Campidoglio*, the citadel of ancient Rome, standing on the Capitoline Hill, the smallest of the seven hills of Rome. It was planned by Tarquinius Priscus, but not completed till after the expulsion of the kings. At the time of the civil commotions under Sulla it was burned down, and rebuilt by the senate. It suffered the same fate twice afterwards, and was restored by Vespasian and by Domitian, who instituted there the Capitoline games. The present capitol (Campidoglio), standing partly on the site of the old one, is a modern edifice, begun in 1536 after the design of Michael Angelo. It is used as a *hôtel de ville*, museum, etc., contains some fine statues and paintings, and commands a superb view of the Campagna.—The name of *capitol* is also given to the edifice in Washington where Congress assembles and it is common in the states to call their statehouses *capitols*. The site of the capitol at Washington was selected by Washington in 1791. The interior of the building was burned out by the British in 1814. The cornerstone of the great extension was laid in 1851, the

capitol being completed in 1863. It is of sandstone, iron and marble; cost $16,000,000, fresco-painting and sculpture being used lavishly in interior decorations. The centennial anniversary of the laying of the cornerstone was celebrated, Sept. 18, 1893.

**Capitulation** (ka-pit-ū-lā'shun), in military language, the act of surrendering to an enemy upon stipulated terms, in opposition to *surrender at discretion.*

**Capnomancy** (kap'nō-man-si), divination by the ascent or motion of the smoke either of a sacrifice or of burning vervain, seeds of jasmine, poppy, etc.

**Capodistria** (kä'pō dis'tri-ä), a seaport of Austria, on the Gulf of Trieste, 9 miles S. of Trieste. A very ancient town, and with extensive salt works. It stands on a rock in the sea and is connected by a stone causeway with the mainland. Pop. 10,711.

**Capo d'Istria,** JOHN ANTONY, COUNT, a Greek statesman, born at Corfu in 1776. In 1809 he entered the service of Russia and obtained an appointment in the department of foreign affairs. As imperial Russian plenipotentiary he subscribed the Treaty of Paris, Nov. 20, 1815. In 1828 he became president of the Greek Republic, in which office he was very unpopular, and in 1831 he was assassinated by Constantine and George Mauromichalis.

**Caponiere,** or CAPONNIERE (kap-o-ner'), in fortifications, a passage from one part of a work to the other, protected on the right and left by a wall or parapet, and sometimes covered overhead. When there is a parapet on one side only it is called a *demicaponiere.*

**Cappadocia** (kap-a-dō'si-a), in antiquity, one of the most important provinces in Asia Minor, the greater part of which is included in the modern province of Karaman. Its boundaries varied greatly at different times. It was conquered by Cyrus, and was ruled by independent kings from the time of Alexander the Great until 17 A.D., when it became a Roman province. It was traversed by the river Halys, and among its chief towns were Comana, Ariarathia, and Tyana.

**Cappaugh Brown** (kap'ah), a bituminous earth, colored by oxide of manganese and iron, which yields pigments of various rich brown colors: called also *manganese brown.* It derives its name from Cappagh, near Cork, in Ireland.

**Capparidaceæ** (kap-a-ri-dā'se-ē), a nat. order of dicotyledonous, polypetalous, herbaceous plants, shrubs and trees, having four petals and sepals, a great number of stamens, and an ovary elevated upon a long stalk. All of them appear to be more or less acrid. Some are very poisonous, others act as vesicatories, and a few are merely stimulant, as the *Capparis spinosa,* or caper-bush, the flower-buds of which constitute the capers of the shops.

**Capraja** (kä-prä'yä), a small volcanic island belonging to Italy, about 15 miles in circumference, situated between the north point of Corsica and the coast of Tuscany. Its principal product is wine.

**Caprera** (kä-prä'rä), a small rocky and infertile Italian island, on the N. E. of Sardinia, and separated from it by a narrow strait. Area about 15 sq. m. It was for many years the place of retirement of the Italian liberator Garibaldi, who died here in 1882.

**Capri** (kä'prē), ancient *Capreæ,* an island belonging to Italy, in the Gulf of Naples, 5 miles long and 2 broad, rising to the height of about 1900 feet, everywhere well cultivated. The inhabitants, amounting to 6200, are occupied in the production of oil and wine, in fishing, and in catching quails at the seasons of their migrations. It contains the towns of Capri in the east, and Anacapri in the west, situated on the summit of a rock, and accessible by a stair of 522 steps. The Emperor Tiberius spent here the last seven years of his life. The ruins of his palaces are still extant, and other ruins are scattered over the island. The island has several stalactitic caverns or grottoes in its steep rocky coast, which are famed for the wondrous colors reflected on the rocks, the Blue Grotto being the most famous.

**Capriccio** (ka-prich'i-o), a musical composition, the form of which is left very much to the composer's fancy.

**Capricornus,** CAPRICORN (kap'ri-korn), a constellation of the southern hemisphere, and one of the twelve signs of the zodiac, the one to which belongs the winter solstice, represented by the figure of a goat or a figure having the forepart like a goat and the hindpart like a fish. Its symbol is ♑.—*Tropic of Capricorn.* See *Tropics.*

**Capridæ** (kap'ri-de: L. *caper,* a goat), the goat tribe, a family of ruminating animals, in which

the horns are directed upwards and backwards, and have a bony core.

**Caprification** (kap-ri-fi-kā'shun), a horticultural operation performed by the ancients upon figs. It consists in suspending above the cultivated figs branches of the wild fig covered with a species of gall insect, which carries the pollen of the male flowers to fertilize the female flowers of the cultivated fig. The term is also applied to the fecundation of the female date palms by shedding over them the pollen from the male plant.

**Caprifoliaceæ** (kap-ri-fō-li-ā'se-ē), a nat. order of monopetalous dicotyledons. It includes a number of erect or twining shrubs and herbaceous plants, comprising the honeysuckle, elder, viburnum, and snowberry. The characteristics of the order are opposite leaves without stipules, free anthers, epipetalous stamens, and fruit not splitting open when ripe.

**Caprimulgidæ** (kap-ri-mul'ji-dē), the goat-suckers, a family of insessorial, fissirostral birds, nearly allied to the Hirundinidæ or swallow tribe.

**Caprivi** (kä-prē'vi), GEORG LEO, born at Berlin in 1831; died in 1899. He entered the army in 1849, fought in the Austrian and French wars, was head of the admiralty 1883–88, and on the fall of Bismarck in 1890, succeeded him as prime minister and imperial chancellor. Resigned the premiership in 1894, but remained chancellor.

**Capsicine** (kap'si-sēn), a volatile alkaloid, the active principle of the capsules of *Capsicum annuum*, or *C. fastigiatum* (order *Solanaceæ*), known as Guinea (red) pepper. It has a resinous aspect and a burning taste.

**Capsicum** (kap'si-kum), a genus of annual, subshrubby plants, order Solanaceæ, with a wheel-shaped corolla, projecting and converging stamens, and a many-seeded berry. They are chiefly natives of the East and West Indies, China, Brazil, and Egypt, but have spread to various other tropical or subtropical countries, being cultivated for their fruit, which in some reaches the size of an orange, is fleshy and variously colored, and contains a pungent principle (see *Capsicine*), which is present also and more largely in the seed. The fruit or pod is used for pickles, sauces, etc., and also medicinally. Several of them, as *C. annuum*, *C. frutescens*, and *C. baccātum*, yield Cayenne pepper, and the first (called often Guinea pepper, though originally a native of South America) also yields chillies. *C. baccātum* is called bird-pepper. See *Cayenne Pepper*.

Capsicum (*Capsicum annuum*)

**Capstan** (kap'stan), a strong upright column of timber, movable round a strong iron spindle, and having its upper extremity pierced to receive bars or levers, for winding a rope round it to raise weights, such as the anchors of a vessel, or to perform other work that requires great power.

**Capsule** (kap'sūl), in botany, a dry fruit containing many cells and seeds, and usually opening by valves. Also, a small tube-like vessel of gelatine used in the administration of medicines, which are contained therein.

**Captain** (kap'tin), one who is at the head or has authority over others, especially: (1) The military officer who commands a company, whether of infantry, cavalry, or artillery. (2) An officer in the navy commanding a ship of war. The naval captain is next in rank above the commander, and in the United States ranks with a colonel. In the U. S. navy captains are generally appointed from the rank of commander in the order of seniority by the President, subject to the Senate's approval. *Captain of the fleet*, in the British navy, a flag-officer temporarily appointed by the admiralty, who acts as adjutant-general of the force, sees to carrying out of orders of the commander-in-chief, and to proper discipline being maintained in the fleet. (3) The master of a merchant vessel.

**Caption** (kap'shun), in law, a certificate stating the time and place in executing a commission in chancery, or of taking a deposition, or of the finding of an indictment, and the court or authority before which such act was performed, and such other particulars as are necessary to render it legal and valid.

**Capua** (kap'ū-a), a fortified city of Italy, province Caserta, in a plain 18 miles N. of Naples, on the Volturno, which is crossed by a handsome bridge. It is the residence of an archbishop, and has a cathedral. Pop. 12,389. The ancient city was situated 3½ miles S. E. from the modern town. The site is now occupied by a small town, called Santa-Maria-di-Capua Vetere. The ancient Capua was of such extent as to be compared to Rome and Carthage. It was a favorite place of resort of the

Romans on account of its agreeable situation and its healthy climate, and many existing ruins (including an amphitheater) attest its ancient splendor.

**Capuchin Monkey** (kap'ụ-shin), a name given to various species of South American monkeys of the genus *Cebus*. The hair of their heads is so arranged that it has the appearance of a capuchin's cowl, hence the name. The name is most frequently given to the Sai (*Cebus Capuchinus*), the Horned Sapajou (*C. fatuellus*), as well as to *Pithecia chiroptes*, a monkey belonging to an allied species.

**Capuchins** (kap'ụ-shinz), monks of the order of St. Francis, so called from the *capuchon* or *capuce*, a stuff cap or cowl, the distinguishing badge of the order. They are clothed in brown or gray, go barefooted, never shave their beard. See *Franciscans*.

**Caput mortuum** (kap'ut mor't u-um; L.), literally, a dead head; a fanciful term much used by the old chemists to denote the residuum of chemicals when all their volatile matters had escaped; hence, anything from which all that rendered it valuable has been taken away.

**Capybara** (kap-i-ba'ra; *Hydrochœrus capybāra*), a species of rodent sometimes known by the name of the water-hog, and of the family Caviidæ (Guinea pig). It attains the length of about 3 feet, and has a very large and thick head, a thick body covered with

Capybara (*Hydrochœrus capybāra*).

short, coarse, brown hair, and short legs, with long feet, which, being in a manner webbed, fit it for an aquatic life. It has no tail. It is common in several parts of South America, and particularly in Brazil. It feeds on vegetables and fish, which it catches somewhat in the manner of the otter.

**Carabidæ** (ka-rab'i-dē), a family of beetles, usually large adorned with brilliant metallic colors, and either wingless or having wings not adapted for flying. The bombardier beetle belongs to this family.

**Carabine,** or CARBINE (kär'bin), the name given to a short rifle, such as is carried by the American and British cavalry, artillery, and other corps. The name of carbineers is given to the 6th Dragoon Guards of the British army, probably because they were the first regiment of cavalry to be armed with this weapon.

**Carabobo** (kä-ra-vō'vo), a state of Venezuela, washed on the N. by the Caribbean Sea. Area about 2985 sq. m.; pop. 221,895. It is very fertile, producing coffee, cocoa, and sugar. The capital is Valencia, the chief port Puerto Cabello.

**Carabus** (kar'a-bus), a genus of beetles, type of the family Carabidæ (which see).

**Caracal** (kar'a-kal), a species of lynx (*Felis caracal*), a native of Northern Africa and Southwestern Asia. It is about the size of a fox, and mostly of a deep-brown color, having tufts of long black hair which terminate the ears. It possesses great strength and fierceness, and its fur is in high esteem.

**Caracalla** (kar-a-kal'a), MARCUS AURELIUS ANTONINUS, eldest son of the Emperor Severus, was born at Lyons A.D. 188; died in 217. On the death of his father he succeeded to the throne with his brother Antoninus Geta, whom he speedily murdered. To effect his own security upwards of 20,000 other victims were butchered. He was himself assassinated by Macrinus, the pretorian prefect, who succeeded him.

Caracalla.

**Caracara** (kar-a-kar'a; from its hoarse cry), the popular name for *Polyŏbrus Braziliensis* (the Brazilian caracara) and several other raptorial birds of the subfamily Polyborinæ, family Falconidæ. They are of considerable size, natives of South America, and are characterized by having the bill hooked at the tip only, the wings long, and the orbits, cheeks, and part of the throat more or less denuded of feathers.

**Caracas** (ka-rāk'as), a city of South America, capital of Venezuela, situated in a fine valley about 3000

feet above the Caribbean Sea, connected by railway with the port La Guayra, about 10 miles distant. It is regularly laid out, and has some good buildings, including a cathedral, university, federal palace, and other government buildings, etc. It has various parks and gardens, gas and water supply, telephones, tramways, etc. It is an export center for coffee, cacao, and tobacco. In 1812 it was in great part destroyed by an earthquake, and nearly 12,000 persons buried in the ruins. Pop. about 90,000.

**Caracci** (kä-räch'ē). See *Carracci.*

**Caraccioli** (kä-räch'o-lē), Francesco, an Italian admiral, born at Naples about 1748; died in 1799. In 1798 he entered the service of the Parthenopean Republic, and repelled, with a few vessels, an attempt of the Sicilian-English fleet to effect a landing. When Ruffo took Naples in 1799 Caraccioli was arrested, and contrary to the terms of capitulation, was condemned to death, and hanged at the yard-arm of a Neapolitan frigate, Lord Nelson consenting to his execution.

**Caractacus** (ka-rak'ta-kus), a king of the ancient British people called Silures, inhabiting South Wales. He defended his country with great perseverance against the Romans, but was at last defeated, and led in triumph to Rome, A.D. 51, after the war. His noble bearing and pathetic speech before the Emperor Claudius procured his pardon, but he and his relatives appear to have remained in Italy.

**Caradoc Sandstone** (kar'a-dok), in geology, an upper division of the lower Silurian rocks, consisting of red, purple, green, and white micaceous and sometimes quartzose grits and limestones containing corals, mollusca, and trilobites. Named after the hilly range of *Caer-Caradoc* in Shropshire.

**Carafe** (ka-raf), the French name for an ordinary glass bottle or decanter for holding drinking water.

**Carageen.** See *Carrageen.*

**Caraites.** See *Karaites.*

**Caraman.** See *Karaman.*

**Caramania.** See *Karamania.*

**Carambola** (kar-am'bo-la), the fruit of an East Indian tree, the *Averrhŏa Carambŏla*, order Oxalidaceæ. It is of the size and shape of a duck's egg, of an agreeable acidulous flavor, used in making sherbets, tarts, and preserves.

**Caramel** (kar'a-mel), the brown mass which cane-sugar becomes at the temperature of 220° C., used in cookery as a coloring and flavoring ingredient, in giving a brown color to spirits, etc.—The name of a certain preparation of candy.

**Carana Resin** (ka-ra'na), a kind of balsamic resin obtained from *Bursĕra acuminăta* and imported from tropical America.

**Carapa** (ka-ra'pa), a genus of tropical plants, nat. order Meliaceæ. A South American species, *C. Guianensis*, is a fine large tree, whose bark is in repute as a febrifuge. Oil made from its seeds (called carap-oil or crab-oil) is used for lamps, and masts of ships are made from its trunk. The wood is called crabwood. The oil of the African species, *C. Guineensis*, called Coondi, Kundah, or Talicoona oil, is used by the negroes for making soap and anointing their bodies. The oil of the South American carapa is used for the same purpose also.

**Carapace** (kar'a-pās), the upper part of the hard shell or case of chelonian reptiles, as the tortoise or turtle, the lower part being called *plastron.* The same name is also given to the covering of the anterior superior surface of the Crustacea.

**Carat** (kar'at), a weight of 3.17 troy grains, used by jewelers in weighing precious stones and pearls. The term is also used to express the proportionate fineness of gold. The whole mass of gold is divided into twenty-four equal parts, and it is called gold of so many carats as it contains twenty-fourth parts of pure metal. Thus if a mass contain twenty-two parts of pure gold out of every twenty-four it is gold of twenty-two *carats.*

**Carausius** (ka-rą'si-us), a Roman general, a native of Batavia. He was sent by the Emperor Maximianus to defend the Atlantic coasts against the Franks and Saxons; but foreseeing impending disgrace, he landed in Britain and got himself proclaimed emperor by his legions (287 A.D.). In this province he was able to maintain himself six years, when he was assassinated at York by one of his officers named Allectus (293 A.D.).

**Caravaca** (kär-a-vä'ka), a town of Spain, province of Murcia, and 43 miles W. by N. of the town of Murcia. It has manufactures of woolen and hempen goods, paper, soap, and earthenware. Pop. 15,846.

**Caravaggio** (kä-rä-väj'ō), a town of N. Italy, prov. of Bergamo, 24 miles E. of Milan, on the Gera d' Adda. It is celebrated as the birthplace of the two great painters Polidoro Caldara and Michel Angelo Merighi, both called *Caravaggio*. Pop. 8786.

**Caravaggio,** MICHEL ANGELO AMERIGHI, *or* MERIGHI DA, a celebrated painter, born at Caravaggio 1569; died 1609. He attained distinction as a colorist of the Neapolitan school, being considered the head of the so-called Naturalists' school. He was coarse and violent in his character and habits, and was in continual trouble through his quarrelsome disposition. Among his chief pictures are the *Card Player* (at Dresden), the *Burial of Christ*, *St. Sebastian*, *Supper at Emmaus*, and a *Holy Family*.

**Caravaggio.** See *Caldara*.

**Caravan** (kar'a-van), a Persian word used to denote large companies which travel together in Asia and Africa for the sake of security from robbers, having in view, principally, trade or pilgrimages. In Mohammedan countries caravans of pilgrims are annually formed to make the journey to Mecca. The most important are those which annually set out from Damascus and Cairo. Camels are used as a means of conveyance on account of their remarkable powers of endurance. Many of the pilgrims now, however, travel by railway, where this is available.

**Caravansary** (kar-a-van'sa-ri), CARAVANSERAI, in the East, a place appointed for receiving and lodging caravans; a kind of inn where the caravans rest at night, being a large square building with a spacious court in the middle. Though caravansaries in the East serve in place of inns, there is this radical difference between them, that, generally speaking, the traveler finds nothing in a caravansary for the use either of himself or his cattle. He must carry all his provisions and necessaries along with him. Those built in towns serve not only as inns, but contain shops, warehouses, and even exchanges.

**Caravel** (kar'a-vel), the name of different kinds of vessels, particularly a small ship used by the Spaniards and Portuguese in the 15th and 16th centuries for long voyages. It was narrow at the poop, wide at the bow, and carried a double tower at its stern and a single one at its bows. It had four masts and a bowsprit, and the principal sails were lateen sails. It was in command of three such caravels that

Caravel of the Fifteenth Century.

Columbus crossed the Atlantic and discovered America.

**Caravellas** (kä-rä-vä'las), a seaport of Brazil, prov. Bahia, the principal port of the surrounding country, and the headquarters of the Abrolhos Islands whale-fishery. Pop. about 4000.

**Caraway** (kar'a-wā; *Carum Carui*), an umbelliferous biennial plant, with a tapering fleshy root, a striated furrowed stem, and white or pinkish flowers. It produces a well-known seed used in confectionery and baking, and from which both a carminative oil is extracted and the liqueur called *kümmel* prepared.

**Carbazotic Acid** (kar-ba-zot'ik), from *carbon* and *azote*; $C_6H_3N_3O_7$), a crystallizable acid and bitter substance obtained by the action of nitric acid on indigo and some other animal and vegetable substances. It is of great importance in dyeing. When silk which has been treated with a mordant of alum or cream of tartar, is immersed in a solution of this acid, it is dyed of a beautiful yellow color. Often called *picric acid*. It is easily soluble in water and not a 'fast' dye.

**Carbide** (kar'bīd), a compound of carbon with a metal, the usual effect of which is to render it hard and brittle. Formerly called *Carburet*. Of the carbides, that of calcium has recently become important as an abundant source of acetylene, remarkable for its illuminating powers. It is produced by the treatment of lime, and carbon in any form, in an electric furnace, the carbon and calcium combining into a solid substance. This, when brought into contact with water, produces a double decomposition, the principal product being

acetylene ($C_2H_2$), which rises as a combustible gas.

**Carbine** (kar'bīn). See *Carabine*.

**Carbohydrate** (kar-bō-hī'drāt) an organic compound consisting of carbon, with oxygen and hydrogen in the proportion to form water ($H_2O$), as starch and cellulose. The carbohydrates are an important class of foods.

**Carbolic Acid** (kar-bol'ik; $C_6H_6O$), an acid obtained from coal-tar. It is, when pure, a colorless crystalline substance, but it is usually found as an oily liquid, colorless, with a burning taste and a characteristic odor. Carbolic acid is now much employed as a therapeutic and antiseptic. It may be taken internally in cases in which creosote is indicated; but its principal use in medicine is as an external application to bacterially infected sores, compound fractures, and to abscesses after they have been opened, about which it establishes a protective zone, due to its antiseptic properties, and repels invasion of the organic germs floating in the atmosphere, which would produce decomposition in the wound. The action of the acid is not only to exclude these germs but also to destroy such as may have been admitted, for which reason it is introduced into the interior of the wound. Called also *phenic acid* and *phenol*.

**Carbon** (kar'bon), one of the most important of the chemical elements, non-metallic and existing uncombined in three forms, charcoal, graphite or plumbago, and the diamond; chemical symbol C, atomic weight 12. The diamond is the purest form of carbon; in the different varieties of charcoal, in coal, anthracite, etc., it is more or less mixed with other substances. Pure charcoal is a black, brittle, light, and inodorous substance. It is usually the remains of some vegetable body from which all the volatile matter has been expelled by heat; but it may be obtained from most organic matters, animal as well as vegetable, by ignition in close vessels. Carbon, being one of those elements which exist in various distinct forms, is an example of what is called *allotropy*. The compounds of this element are more numerous than those of all the other elements taken together. With hydrogen especially it forms a very large number of compounds, called hydrocarbons, which are possessed of the most diverse properties, chemical and physical. With oxygen, again, carbon forms only two compounds, but union between the two elements is easily effected. It is one of the regular and most characteristic constituents of both animals and plants. See *Diamond, Charcoal, Graphite, Boneblack, Carbonic Acid, Coke*, etc.

**Carbonari** (kar-bo-na'ri; lit. 'charcoal-burners'), the name of an Italian political secret society, which appears to have been formed by the Neapolitan republicans during the reign of Joachim (Murat), and had for its object the expulsion of the strangers and the establishment of a democratic government. The ritual of the Carbonari was taken from the trade of the charcoal-burner. A lodge was *baracca* (a hut); a meeting was *vendita* (a sale); an important meeting *alta vendita*. There were four grades in the society; and the ceremonies of initiation were characterized by many mystic rites. The order, soon after its foundation, contained from 24,000 to 30,000 members, and increased so rapidly that it spread through all Italy. In 1820, in the month of March alone, about 650,000 new members are said to have been admitted. After the suppression of the Neapolitan and Piedmontese revolution in 1821, the Carbonari, throughout Italy, were declared guilty of high treason, and punished as such by the laws. Meanwhile societies of a similar kind had been formed in France, with which the Italian Carbonari amalgamated; and Paris became the headquarters of Carbonarism. The organization took on more of a French character, and gradually alienated the sympathies of the Italian members, a number of whom dissolved connection with it, in order to form the party of "Young Italy." The formation of the Kingdom of Italy removed the occasion for its existence.

**Carbonates** (kar'bo-nāts), compounds formed by the union of carbonic acid with a base, as the carbonate of lime, the carbonate of copper, etc. Carbonates are an important class of salts, many of them being extensively used in the arts and in medicine.

**Carbondale** (kar'bon-dāl), a city of Lackawanna Co., Pennsylvania, 16 miles N. by E. of Scranton. It is the center of a rich coal-field, and contains machine shops, silk mills, and other manufactures. Pop. 17,040.

**Carbonic Acid** (kar-bon'ik; $CO_2$), more properly called *carbonic anhydride* or *carbon dioxide*, a gaseous compound of 12 parts by weight of carbon and 32 of oxygen, colorless, without smell, twenty-two times as heavy as hydrogen, turning blue litmus slightly red, and existing in the atmosphere to the extent of 1 volume in 2500. It is incapable of supporting combustion (with

the single exception of magnesium, which will burn in an atmosphere of carbon dioxide), or animal life, acting as a narcotic poison when present in the air to the extent of only 4 or 5 per cent. It is disengaged from fermenting liquors and from decomposing vegetable and animal substances, and is largely evolved from fissures in the earth, constituting the chokedamp of mines. From its weight it has a tendency to subside into low places, vaults and wells, rendering some low-lying places, as the Upas Valley of Java, and many caves, uninhabitable. It has a pleasant, acidulous, pungent taste, and aerated beverages of all kinds—beer, champagne, and carbonated mineral water—owe their refreshing qualities to its presence, for though poisonous when taken into the lungs, it is agreeable when taken into the stomach. This acid is formed and given out during the respiration of animals, and in all ordinary combustions, from the oxidation of carbon in the fuel. It exists in large quantity in all limestones and marbles. It is evolved from the colored parts of the flowers of plants both by night and day, and from the green parts of plants during the night. During the day plants absorb it from the atmosphere through their leaves, and it forms an important part of their substance as one of the elements of the carbohydrates.

**Carbonic Oxide,** CARBON MONOXIDE (CO), a substance obtained by transmitting carbonic acid over red-hot fragments of charcoal, contained in a tube of iron or porcelain, and also by several other processes, in which its molecule loses one atom of oxygen. It is a colorless, inodorous, irrespirable, gas, sp. gr. 0.9727, has neither acid nor alkaline properties, is very poisonous, and burns with a pale lavender flame. It is a constituent of illuminating gas.

**Carboniferous System** (kar-bŏ-nif'e-rus), in geology, the great group of strata which lie between the Old Red Sandstone below and the Permian or Dyas formation above, named from the quantities of coal, shale, and other carbonaceous matter contained in them. They include the coal measures, millstone grit, and mountain limestone, the first being uppermost and containing the chief coal-fields that are worked. Iron-ore, limestone, clay, and building-stone are also yielded abundantly by the carboniferous strata which are found in many parts of the world, often covering large areas. (See *Coal.*) As coal consists essentially of metamorphosed vegetable matter, fossil plants are very numerous in the carboniferous rocks, more than 1500 species of them having been named, a large proportion of which are ferns, tree lycopods, and large horsetail-like plants. The animals include insects, scorpions, amphibians, numerous corals, crinoids, molluscs, cephalopods, sharks, and other fishes.

**Carbon Points,** in electric lighting, two pieces of very hard, compact carbon, between which the electric current is broken, so that the resistance which they offer to the passage of the current produces a light of extraordinary brilliancy.

**Carborundum** (kär-bō-run'dum), a silicate of carbon, produced by fusing sand and coke (mixed with salt and sawdust) in the intense heat of an electric furnace. There results a mass of bright blue crystals nearly as hard as diamond, and now much used as an abrasive material, it being better adapted than corundum to certain kinds of work.

**Carboy** (kar'boi), a large and somewhat globular bottle of green glass protected by an outside covering of wickerwork or other material, for carrying vitriol or other corrosive liquid.

**Carbuncle** (kar'bung-kl), a beautiful gem of a deep-red color with a mixture of scarlet, found in the East Indies. When held up to the sun it loses its deep tinge, and becomes exactly of the color of a burning coal. The carbuncle of the ancients is supposed to have been a garnet.

**Carbuncle,** in surgery, an inflammation of the true skin and tissue beneath it akin to that occurring in boils. It is more extensive than the latter, and instead of one has several cores. It is associated with a bad state of general health, from which condition its danger arises, for it may threaten life by exhaustion or blood poisoning. With regard to the local treatment, the principal thing to be done is to make a free incision into the tissues. As much of the contents as possible should then be pressed out, and an antiseptic dressing applied. The patient's strength should be supported by nourishing and easily-digested food, and tonics and cordials should be administered.

**Carburet** (kar'bū-ret), the old name for *Carbide.*

**Carburetted** (kar'bū-ret-ed), HYDROGEN, the name given to two compounds of carbon and hydrogen, one known as *light carburetted hydrogen* and the other as *olefiant gas.* The former is the compound $CH_4$, which occurs in coal-mines (firedamp) and about the

neighborhood of stagnant pools. Mixed with atmospheric air from 7 to 14 times that of the gas it explodes. The latter is obtained from distilling coal or fat substances in close vessels. Its symbol is $C_2H_4$, and it explodes when mixed with ten or twelve volumes of atmospheric air.

**Carburettor,** an appliance used in gasoline engines to mix the liquid fuel with air to obtain a vapor. This vapor is drawn into the cylinder, where it is exploded and yields motive power.

**Carcagente** (kär-kä-*hen'tā*), a town of Spain, province of Valencia, on the Jucar, well built, with delightful promenades and gardens. Trade in grain, fruits and silk. Pop. 12,262.

**Carcajou** (kar'ka-jö), a species of badger found in North America, *Meles Labradorica*.

**Carcanet** (kar'ka-net), a necklace or collar of jewels.

**Carcass** (kar'kas), in military language, an iron case, with several apertures, filled with combustible materials, which is discharged from a mortar, howitzer, or gun, and intended to set fire to buildings, ships, and wooden defenses.

**Carcassonne** (kär-ka-son), capital of the dep. Aude, France, on the Aude and a branch of the Canal du Midi, 53 miles S. of Toulouse. It consists of an old and a new town, which communicate by a bridge spanning the river. The old town is surrounded by a double wall, part of it so ancient as to be attributed to the Visigoths. The new town is regularly built, and has many handsome modern houses. The staple manufacture is woolen cloth. Pop. 25,346.

**Carcinoma** (kar-si-nō'ma). See *Cancer* (disease).

**Card,** an instrument for combing, opening, and breaking wool, flax, etc., freeing it from the coarser parts and from extraneous matter. It is made by inserting bent teeth of wire in a thick piece of leather, and nailing this to a piece of oblong board to which a handle is attached. But wool and cotton are now generally carded in mills by teeth fixed on a wheel moved by machinery. The word is derived through the French *carde*, a teasel, from L. *carduus*, a thistle, teasels having been used for cards.

**Card,** an oblong piece of thick paper or pasteboard prepared for various purposes. (1) A piece of cardboard with one's name written or printed on it, used in visiting, and generally for indicating the name of the person presenting it. (2) A piece of cardboard on which are printed certain colored devices or figures, forming one of a *pack*, and used in playing games. A modern pack of playing-cards numbers fifty-two, and consists of four *suits*, two red (hearts and diamonds), and two black (spades and clubs), each suit comprising thirteen cards—three picture-cards (*court*-cards), the king, queen, and knave; and ten other cards numbered from one, the ace, to ten, according to the pips or marks belonging to the respective suits printed on them. They are generally said to be of Eastern origin, but this is doubtful. They were known in Europe in the 14th century. The manufacture of playing cards, from the enormous numbers of them used, is now one of some importance, and they are produced in a rather artistic and effective style, the backs often being very ornamental. A large number of games are played with cards, some involving chance only, some combining chance and skill, the best of them furnishing very agreeable and intellectual amusement; whist, perhaps, the best, is a very fine game.—CARD-INDEX, the method now employed in cataloguing the books in a library and for similar purposes. The name cards are perforated and arranged alphabetically on a wire in a case. This renders it at once easy to consult them and to add new cards in their appropriate places.

**Cardamine** (kar-da-mī'nē), a genus of plants, nat. order Cruciferæ. See *Cuckoo-flower*.

**Cardamoms** (kar'da-moms), the aromatic capsules of different species of plants of the nat. order Zingiberaceæ (gingers), employed in medicine as well as an ingredient in sauces and curries. The cardamoms known in the shops are the large, supposed to be produced by *Amōmum angustifolium*, a Madagascar plant; the middle-sized and the small, both supposed to be the produce of *A. Cardamōmum*, a native of Sumatra and other eastern islands. Those recognized in the United States Pharmacopœia, called *true* or officinal cardamoms and known in commerce as *Malabar cardamoms*, are the produce of *Elettaria* (*Alpinia*) *Cardamomum*, a native of the mountains of Malabar and Canara. Ceylon cardamoms are the fruit of *A. grana-paradisi*.

**Cardan** (kar'dan), or CARDA'NO, GERONIMO (*Hieronymus Cardānus*), an Italian philosopher, physician, and mathematician, born in 1501 at Pavia; died about 1576. He held successively the chairs of mathematics or medicine at Pavia, Milan, and Bologna, and

ultimately went to Rome. Here he was received into the medical college, and was allowed a pension by the pope. He acquired extraordinary reputation as a physician, and was invited to Scotland to attend Archbishop Hamilton of St. Andrews, who had been sick for ten years, and who was restored to health by his prescriptions. He made some important discoveries in algebra, studied astrology, pretended to a gift of prophecy, and wrote a large number of books. His chief works are *De Vita Propria*, an account of himself; *Ars Magna*, a treatise on algebra; *De Rerum Varietate; De Rerum Subtilitate;* etc.

**Cardboard** (kard'bōrd), a kind of stiff paper or pasteboard for cards, etc., usually made by sticking together several sheets of paper. Cardboard that is white throughout is called bristol board; that which is brown, with or without a coating or surface of white, is called strawboard or manilla board.

**Cardenas** (kar-dā'nas), a seaport on the north coast of Cuba, 103 miles E. of Havana, with which it is connected by rail. One of the principal commercial centers of the island; chief exports, sugar, molasses, and coffee. Pop. 24,280.

**Cardi** (kar'dē), LODOVICO, surnamed *Civoli*, or *Cigoli*, Italian painter and architect, born in 1559; died in 1631. He studied painting, and afterwards formed his style on the works of Andrea del Sarto, Correggio, and Baroccio. His architectural works possess considerable merit. Among his pictures are: *The Conversion of St. Paul at Rome, The Martyrdom of Stephen, The Trinity, Mary Magdalene*, and *Ecce Homo* at Florence. He painted many altarpieces, excelled to some degree as an engraver, and wrote a treatise on perspective.

**Cardiac** (kar'di-ak) MEDICINES, those which act upon the heart.

**Cardiadæ** (kar'di-a-dē), a family of lamellibranchiate molluscs including the cockles and their allies.

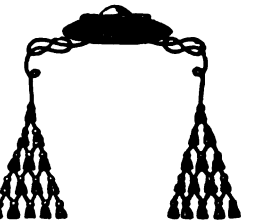
**Cardiff** (kar'dif; 'the city on the *Taff*'), a municipal and parliamentary borough and seaport, the county town of Glamorganshire, Wales, situated at the mouth of the Taff on the estuary of the Severn. It is a rapidly increasing town, and the principal outlet for the mineral produce and manufactures of South Wales. Iron shipbuilding is carried on, and there are iron and other works on a large scale. Among the chief buildings are the county buildings, town-hall, infirmary, university college (for S. Wales and Monmouthshire), law courts, free library and museum, etc. The docks are extensive and well constructed (total area about 200 acres), and various improvements to the port have been lately carried out. As regards tonnage entered and cleared, Cardiff is an important port in Great Britain; in respect of coal exported it is among the first. There is here a castle which dates from 1080. It is the property of the Marquis of Bute, who has modernized it, and converted part of it into a residence. Population (1911), 182,259.

**Cardiff Giant,** the name given to a rudely carved statue, dug up at Cardiff, New York, in 1869, and exhibited as a petrified human body. It was eventually proved to be a fraud, which had been carved in Iowa, secretly conveyed to Cardiff and buried there.

**Cardigan** (kar'di-gan), the county town of Cardiganshire, South Wales, on the river Teifi, about 3 miles from its mouth in Cardigan Bay. Vessels of light tonnage come up to the wharves. The ruins of Cardigan Castle, famous in Welsh history, are in the vicinity. The salmon-fishery is extensively carried on. Previous to 1885 it was one of a group of parliamentary boroughs. Pop. 3578.—The COUNTY of Cardigan has an area of 693 sq. miles, of which two-thirds is under crops or pasture. The surface of the northern and eastern parts is mountainous, but interspersed with fertile valleys, while the southern and western districts are more level and produce abundance of corn. The county has an extensive coast-line, and many of the male population are sailors and fishermen. It is rich in metalliferous lodes, the lead-mines still yielding largely. The principal town is Aberystwith. Pop. 59,877.

**Cardigan Bay,** a large open expanse of sea on the west coast of Wales, having Cardiganshire on the east and Carnarvon on the north.

**Cardinal** (kar'di-nal), an ecclesiastical prince in the Roman Catholic Church, who has a voice in the conclave at the election of a pope, the popes being taken from the cardinals. The cardinals are appointed by the pope, and are divided into three classes or orders, comprising six bishops, fifty priests, and fourteen deacons, making seventy at most. These constitute



Cardinal's Hat.

the Sacred College and compose the pope's council. Originally they were subordinate in rank to bishops; but they now have the precedure. The chief symbol of the dignity of cardinal is a low-crowned, broad-brimmed red hat, with two cords depending from it, one from either side, each having fifteen tassels at its extremity. Other insignia are a red biretta, a purple cassock, a sapphire ring, etc.

**Cardinal Bird,** *Cardinālis Virginiānus*, a North American bird of the finch family, with a fine red plumage and a crest on the head. Its song resembles that of the nightingale, hence one of its common names, *Virginian nightingale*. In size it is about equal to the starling. Called also *scarlet grosbeak* or *cardinal grosbeak* and *redbird*.

**Cardinal-flower,** the name commonly given to *Lobēlia cardinālis*, because of its large, very showy, and intensely red flowers; it is a native of the United States, growing on the edge of streams.

**Cardinal Points,** the N., S., E., and W. points of the horizon; the four intersections of the horizon with the meridian and the prime vertical circle.

**Cardinal Virtues,** or PRINCIPAL VIRTUES, in morals, a name applied to justice, prudence, temperance, and fortitude.

**Carding** (kard'ing), the process that wool, cotton, flax, etc., undergo previous to spinning, to lay the fibers all in one direction, and remove all foreign substances. See *Card.*

**Carditis** (kar-dī'tis), inflammation of the heart substance. Inflammation of the lining membrane is *endocarditis;* of the external membrane, *pericarditis;* of the heart muscle, *myocarditis*. See *Heart.*

**Cardium** (kar'di-um). See *Cockle* (the mollusc).

**Cardona** (kär-dō'na), a Spanish town, prov. of Barcelona. In its vicinity is a hill of rock-salt 500 feet high, which has a dazzling appearance in the sunlight. It is absolutely pure and is regularly mined, while vases, crosses, etc., are carved from the material. Pop. 3855.

**Cardoon** (kar-dōn'), the *Cynāra Cardunculus*, a perennial plant belonging to the same genus as the artichoke, and somewhat resembling it. It is a native of Canada. The thick fleshy stalks and ribs of its leaves are blanched and eaten as an esculent vegetable. In this country they are not much esteemed, but form an important object in France.

**Cards, Playing.** See *Card.*

**Carducci** (kär-dōōt'chē), GIOUSÈ, an Italian poet, born at Valdicastello, July 27, 1836; died in 1907. While filling the chair of Italian Literature at Bologna, he wrote the celebrated *Hymn to Satan* and other poems. The most famous of his works are the three series of *Odi Barbare.*

**Carduus** (kar'dū-us). See *Thistle.*

**Careening** (ka-rēn'ing), a nautical term for heaving or bringing a ship to lie on one side for the purpose of caulking, repairing, cleansing, paying with pitch, or the like.

**Caret** (ka'ret; L., 'there is something wanting'), in writing, a mark made thus, ∧, which shows that something, omitted in the line, is superscribed or inserted in the margin.

**Carew** (ka-rō), THOMAS, an English poet, born of a Gloucestershire family in 1589; died in 1639. Educated at Oxford, he cultivated polite literature in the midst of a life of affluence and gaiety, and was the subject of much eulogy by Ben Jonson, Davenant, and other writers of the period. His works are masques, lyrics, and sonnets, and were first printed in 1640.

**Carex** (kā'reks), a large genus of plants, nat. order Cyperaceæ; the sedges. They are perennial grass-like herbs, with unisexual flowers aggregated in spikelets. There are more than a thousand species, over 140 of which are natives of North America.

**Carey** (kā'rē), HENRY, a composer, dramatist, and poet, born at London in 1696, was a natural son of George Saville, Marquis of Halifax. He composed the words and music of many popular songs, including *Sally in Our Alley, God Save the King*, etc. He also wrote farces and other works. He is said to have committed suicide, 1743. His son GEORGE SAVILLE CAREY (born about 1743, died 1807) was also a voluminous writer of songs.

**Carey** (kā'rē), HENRY CHARLES, economist, born in Philadelphia 1793; died 1879. He was the eldest son of Matthew Carey, a bookseller and author who wrote *Essays on Political Economy*, advocating a protective tariff. In 1836 he published an essay on the *Rate of Wages*, which he afterwards expanded into *Principles of Political Economy.* His other important works are *The Credit System; The Past, the Present and the Future; The Principles of Social Science*, etc. Originally a free-trader he

became an advocate for protection; held that the growth of population was self-regulating; and was opposed to the theories of Ricardo and others on the law of diminished returns from the soil and on rent.

**Carey,** Rosa Nouchette, novelist, born in London and in 1866 published her first novel, *Nellie's Memories*. Other works were *Barbara Heathcote's Trial, Not Like Other Girls, Other People's Lives*, etc. She died in 1909.

**Carey,** William, an English oriental scholar and Christian missionary, born in 1761; died at Serampore 1834. He was early apprenticed to a shoemaker, but his natural turn for languages, and his zeal for the spread of the gospel, were too strong to be overcome. With the little assistance he could procure he acquired Latin, Greek, and Hebrew, and likewise studied theology. In 1786 he became pastor of a Baptist congregation at Moulton, and in 1787 was called to a similar situation in Leicester. In 1793

William Carey.

he sailed for the East Indies as a Baptist missionary, and in 1800, in conjunction with Marshman, Ward, and others, he founded the missionary college at Serampore. Here he had a printing-press, and issued various translations of the Scriptures. His first work was a *Bengali Grammar*. It was followed by the *Hitopadesha*, in the Mahratta tongue, a *Grammar of the Telinga and Carnatic*, and a *Bengali Lexicon*. Under his direction the whole Bible was translated into six, and the New Testament into twenty-one, Hindustani dialects. He was long professor of Sanskrit, Mahratta, and Pengali, in Calcutta.—His son, Felix Carey, born in 1786; died 1822; was the author of a *Burmese Grammar*, and translated several English works into Bengali, Sanskrit, and Burmese.

**Cargill** (kar'gil), Donald, a Scottish covenanting preacher, was born about 1610; died 1681. He studied at Aberdeen, and became minister of the Barony Church in Glasgow in 1650. In 1679 he took part in the battle of Bothwell Bridge, where he was wounded. He had a principal hand in the Queensferry and Sanquhar Declarations. For formally excommunicating Charles II, the Duke of York, and others, he was executed at Edinburgh for high treason.

**Cargo** (kar'gō), the goods or merchandise carried by a trading vessel from one place to another. When part of the cargo is on deck it is called the *deck cargo*, as distinguished from the *inboard cargo*.

**Caria** (kā'ri-a), an ancient country, forming the S.W. corner of Asia Minor, and partly settled in early times by Greek colonists chiefly of the Dorian race. It was included in the dominions of Crœsus, King of Lydia, and on his overthrow by Cyrus was transferred to the Persian monarchy, under whose protection a dynasty of Carian princes was established. About B.C. 129 it was incorporated in the Roman province of Asia. Cnidus, Halicarnassus, and Miletus were among the chief towns.

**Cariaco** (kä-rē-ä'kō), a seaport town of Venezuela, situated E. of the Gulf of Cariaco, near the mouth of a river of the same name. Pop. 7000. The Gulf of Cariaco is 38 miles long, from 5 to 10 broad, from 80 to 100 fathoms deep, surrounded by lofty mountains.

**Cariocou** (kar'i-akō), the Virginian deer (*Cervus Virginianus*), found in all parts of North America up to 43° N. lat. It is smaller than the common stag, and its color varies with the season. In spring it is reddish brown, in autumn slaty blue, and in winter dull brown. Written also *Carjacou*.

**Cariama.** See *Seriema*.

**Cariatides.** See *Caryatides*.

**Caribbean Sea** (kar-i-bē'an), that portion of the North Atlantic Ocean lying between the coasts of Central and South America, and the West India Islands. It communicates with the Gulf of Mexico by the Yucatan Channel.

**Caribbee Bark** (kar'i-bē), the bark of the *Ewostemma Caribæum*, a tree growing in the West Indies, closely allied to cinchona, and occasionally substituted for the true species of

the latter. It is called also *St. Lucia bark.*

**Caribbees,** or LESSER ANTILLES, usually divided into the Windward and Leeward Islands, a section of the West India Islands.

**Cariboo** (kar'i-bö). CARIBOU, the name of two American species of reindeer, sometimes regarded as specifically identical with the Old World reindeer. They have never been brought under the sway of man, but are a great object of chase for the sake of their flesh. The woodland cariboo (*Rangifer caribou*) most nearly resembles the common reindeer. It is found over considerable tracts of Canada, as also in Newfoundland and Labrador, and is migratory in its habits. The Barren Ground cariboo (*Rangifer Grœnlandicus*) is much smaller, but has larger horns. It inhabits the Barren Grounds northwest of Hudson Bay, and also extends into Greenland. It executes considerable migrations, going north to the Arctic Ocean in summer, and returning in autumn.

**Caribs** (kar'ibs), the original inhabitants of the W. Indian Islands, and, when Europeans became acquainted with America, also found in certain portions of Central America and the north of South America. A fierce, warlike race, they were largely eradicated by the Spaniards in the effort to subdue them. At present only a few remain on Trinidad, Dominica, and St. Vincent, but there are many of them in the north of South America, from the Isthmus of Darien nearly to the mouth of the Amazon.

**Carica.** See *Papaw.*

**Caricature** (kar'i-ka-tūr; It. *caricatura*, from *caricare*, to load, to overcharge), a representation of the qualities and peculiarities of an object, but in such a way that beauties are concealed and peculiarities or defects exaggerated, so as to make the person or thing ridiculous, while a general likeness is retained. Though a degenerate, it is one of the oldest forms of art. Egyptian art has numerous specimens of caricature, and it has an important place in Greek and Roman art. It flourished in every European nation during the middle ages, and in the present day it is the chief feature in the so-called comic journals.

**Caries** (kā'ri-ēz; L., 'rottenness'), a disease of bone analogous to ulceration in soft tissues. The bone breaks down, or may be said to melt down into unhealthy matter, which works its way to the surface and bursts. Excision of the carious portion of the bone is often effected with good results, but the disease often results in death. *Caries of the teeth* is decay of the dentine or body of the tooth.

**Carignano** (kä-rē-nyä'nō), a town of Italy, 11 miles S. of Turin, left bank of the Po. From this town is named a branch of the house of Savoy. Pop. 4672.

**Carillon** (kar'il-lon), a set of bells in a tower or belfry on which tunes may be played.

**Carimata** (kar-i-ma'ta), an island about 50 miles from the coast of Borneo. It is about 10 miles long and rises to a height of 2000 feet. It is visited by Malays, who collect tortoise shell, tripang, and edible birdnests.

**Carinaria** (kar-i-nā'ri-a), a genus of gasteropodous molluscs, of the order called Heteropoda or Nucleobranchiata, whose shells are known as Venus's slipper and glass nautilus. The gills are protected by a small and very delicate shell of glassy translucence. The creature itself is about 2 inches in length, and is of oceanic habits. It is so transparent that the vital functions may be watched by the aid of a microscope.

**Carinatæ** (kar-i-nā'tē; from L. *carina*, a keel), Huxley's second order of the class Aves or birds, the other two being Saururæ and Ratitæ. The Carinatæ include all the living flying birds, that is, all existing birds except the Cursores, and are characterized by the fact that the sternum or breast-bone is furnished with a prominent median ridge or keel, whence the name.

**Carini** (ka-rē'ne), a town of Sicily, 11 miles W. N. W. of Palermo, beautifully situated on river of same name. It has a mediæval Gothic castle. Pop. 13,931.

**Carinthia** (ka-rin'thi-a; German, Kärnthen), a western duchy or province of Austria, on the borders of Italy; area, 4006 square miles. It is extremely mountainous, generally sterile, and one of the most thinly populated provinces of Austria. The principal river is the Drave. The iron, lead, and calamine mines are the main sources of its wealth, though there are several manufactories of woolens, cottons, silk stuffs, etc., most of which are in Klagenfurt, the capital. Pop. 367,344.

**Carisbrooke** (kar'is-bruk), a village near the center of the Isle of Wight, and overlooked by the ruins of its ancient castle, where Charles I was imprisoned thirteen months previous to his trial and execution.

**Carissimi** (kä-ris'e-mē), GIOVANNI GIACOMO, an Italian musical composer, born about 1604; died at Rome about 1674. He wrote many oratorios, cantatas, and motets, and occupies an important place in the history of music.

**Carjacou** (kar'ja-kō). See *Cariacou.*

**Carlen** (kar'lān'), EMILIE, a Swedish novelist, born in 1807; died in 1883. She was married to Johan Gabriel Carlen (1814–75), a lawyer and miscellaneous writer. Her graphic pictures of everyday life have secured her a place among the great romance writers of the day. Many of her novels have been translated into Danish, French, German, and English.

**Carleton** (karl'tun), HENRY GUY, playwright, born at Fort Union, New Mexico, in 1856, the son of Gen. J. H. Carleton. He joined the army, served against the Indians, resigned in 1876 and engaged in journalism and dramatic writing. Of his plays, the best known is *A Gilded Fool.* He also wrote *Victor Durand, The Pembertons, A Bit of Scandal,* etc. His last play was, *The Girl from Maxim's.* He died Dec. 10, 1910.

**Carleton,** WILLIAM (WILL), poet, born at Hudson, Michigan, Oct. 21, 1845. His poems are largely quaint and pathetic pictures of rural life, including *Farm Ballads, Farm Festivals, Farm Legends, City Ballads, City Legends City Festivals, Songs of Ten Centuries.* He died in Brooklyn, Dec. 18, 1912.

**Carleton** (karl'ton), WILLIAM, an Irish novelist, born in 1798 at Prillisk, County Tyrone; died at Sandford, near Dublin, Jan. 30, 1869. His education commenced at a hedge-school, and terminated with two years' training in an academy kept by a relation, a priest, at Glasslough. Thence he went to Dublin to try his fortune in the walks of literature. There, in 1830–32, were published his *Traits and Stories of the Irish Peasantry.* Among his other publications are: *The Misfortunes of Barney Branagan; The Black Prophet; Willey Reilly;* and the *Evil Eye;* this last novel appearing in 1860. He enjoyed a government allowance of £200 per annum several years before his death.

**Carline** (kar'līn) THISTLE (*Carlina vulgāris*), a thistle common in dry fields and pastures throughout Britain and the European continent, about a foot in height, with prickly, somewhat hoary leaves, and a purple head of flowers with a straw-colored involucre.

**Carlisle** (kär-līl'), a parliamentary and municipal borough of England, county town of Cumberland Co. It stands at the confluence of the Eden, Caldew, and Petteril, and has been identified with the *Luguvallum* of Antoninus, from which was derived the British name *Caer-Luel.* Sacked by the Danes, it was rebuilt by William Rufus. It was held by the Scots during their tenure of Cumberland, and the Church of St. Mary's was founded by David I, who died there. During the border wars Carlisle underwent many sieges. It surrendered to Charles Edward in 1745. It is a bishop's see. The cathedral, begun in the reign of William Rufus, was partly destroyed by Cromwell in 1648. In the various improvements of the city all the walls, gates, and fortifications have been removed, except a portion of the w. wall and the castle. The town is somewhat irregularly built, but its principal streets are spacious and well paved. The buildings appropriated to corporate purposes are the town-hall and guildhall. The courts of justice and the county jail were erected after a design by Smirke, at a cost exceeding $500,000. Carlisle is the seat of various manufactures, of which cotton is the principal. Pop. 46,432.

**Carlisle,** a borough of Pennsylvania, capital of Cumberland Co., 19 miles w. s. w. of Harrisburg. It is situated in the fertile Cumberland Valley, and has machine shops, shoe, carriage, axle and car works, etc. Here is the Dickinson Methodist College, founded 1783, and the United States Indian Industrial Training School. Pop. 10,303.

**Carlisle,** JOHN GRIFFIN, Democratic statesman, born in Kenton Co., Kentucky, in 1835. He was admitted to the bar in 1858, became a member of the legislature, and was lieutenant-governor of Kentucky, 1871–75. He was elected to Congress in 1877, and was three times Speaker of the House. He served as United States Senator 1890–93, and was Secretary of the Treasury in President Cleveland's cabinet, 1893–97. He died July 31, 1910.

**Carlists** (kar'lists), the name given to the followers of Don Carlos of Bourbon and his descendants. See *Carlos de Bourbon.*

**Carlos** (kar'los), DON, Infant of Spain, son of Philip II, born in 1545; died in 1568. He was deformed in person, of a violent and vindictive disposition, and though originally declared heir to the throne he was afterwards passed over in favor of his cousins Rodolph and Ernest. In consequence of this he is supposed to have entered into

a plot against the king and the Duke of Alva. Tried on the charge of conspiring against the life of the king, he was found guilty, and imprisoned, waiting sentence from the king. He died shortly after, presumably murdered, but of this there is no proof. The story of Don Carlos has furnished the subject of several tragedies, viz. by Otway (English), Schiller (German), and Alfieri (Italian).

**Carlos de Bourbon,** DON MARIA ISIDOR, the second son of Charles IV of Spain and brother of Ferdinand VII, born in 1788; died in 1855. He was heir presumptive to the throne until the birth of Maria Isabella in 1830. On the death of his brother he claimed the throne as legitimate King of Spain, and was recognized as such by a considerable party, who excited a civil war in his favor, and thenceforward were designated by the title of *Carlists*. After a course of hostilities extending over several years with varying success he found himself obliged in 1839 to take shelter in France. In the meantime he and his descendants had been formally excluded from the succession by a vote of the Cortes in 1836. In 1845 he resigned his claims in favor of his eldest son, and in 1847 was permitted to take up his abode in Trieste, where he died. His eldest son, Don Carlos (1818–61), married Maria Carolina Ferdinanda, a sister of Ferdinand II, King of Naples. On more than one occasion he endeavored to excite an insurrection in his favor in his native country, but these attempts were always frustrated. His nephew, Don Carlos, Duke of Modena, born 1848, followed him as representative of the Carlists. He married the sister of the late Count of Chambord. In 1873 he instigated a rising in the north of Spain, and continued the struggle till after Alfonso XII came to the throne, when he was defeated and withdrew. See *Spain*.

**Carlovingians** (kar-lo-vin'gi-ans), the second dynasty of the French or Frankish kings, which supplanted the Merovingians, deriving the name from Charles Martel or his grandson Charlemagne (that is, Karl or Charles the Great). Charles Martel (715–741) and his son Pepin (741–768) were succeeded by Charlemagne and his brother Carloman (768–771). Charlemagne became sole king in 771, and was succeeded in the Empire of the West by his son Louis le Debonnaire, 814. He divided his empire among his sons, and at his death (840) his son Charles the Bald became King of France. He died in 877, and was succeeded by a number of feeble princes. The dynasty came to an end with Louis V, who died in 987.

**Carlow** (kar'lō), an inland county of Ireland, province of Leinster, surrounded by Kildare, Wicklow, Wexford, Kilkenny, and Queen's County. Area, 346 square miles. The chief rivers are the Slaney and Barrow. From the remarkable fertility of its soil it is altogether an agricultural county, producing a great deal of butter, grain, flour, and other agricultural produce for exportation. Pop. 37,748.—CARLOW, the county town, is on the left bank of the Barrow, 34 miles S. W. of Dublin. It is the principal mart for the agricultural produce of the surrounding country and has flour-mills. There is a Roman Catholic cathedral and divinity college. On a rising ground stand the ruins of the ancient castle of Carlow, still presenting an imposing appearance. Pop. 6513.

**Carlowitz** (kär'lo-vits), a town of Austrian Slavonia, on the Danube, 7 miles S. E. Peterwardein; the center of a famous wine-growing district. A peace was concluded here in 1699 between Austria, Russia, and Poland, and the Turks. Pop. 5500.

**Carlsbad** (kärls'bät; 'Charles' Bath'), a town of Bohemia, famous for its hot mineral springs, and much frequented by visitors from all parts of the world, being useful in diabetes, gout, biliary diseases, etc. Permanent pop. 14,640.

**Carlsburg** ('Charles' Castle'), a town and fortress of Transylvania, near the Maros, 33 miles N. W. of Hermannstadt, with a fine Roman Catholic cathedral, etc. Pop. 11,507.

**Carlscrona** (karls-krö'na; 'Charles' Crown'), a fortified seaport at the southern extremity of Sweden, on the Baltic, capital of the län or province of Blekinge or Carlscrona. It stands on several rocky islets connected with one another and with the mainland by bridges. It is the chief Swedish naval station, the harbor being safe and spacious, with fine dock, shipyards, arsenal, etc. It has a considerable export trade in timber, tar, potash, tallow, etc. Pop. 23,955.

**Carlshamn** (kärls'hăm; 'Charles' Haven'), a seaport town, Sweden, 27 miles W. Carlscrona, exporting timber and articles of timber. Pop. 7091.

**Carlsruhe** (kärls'rö; 'Charles' Rest'), the capital of the Grand-duchy of Baden, 3 miles from the Rhine, laid out in 1715, one of the most regularly built towns in Europe. The castle of the grand-duke stands as a

center, and from this point a number of streets radiate at regular distances, thus forming a kind of fan. There are many handsome edifices. The court library contains 100,000 volumes; there are also a large public library, several valuable museums and art collections, a botanic garden, polytechnic school, etc. The industries are active and varied. Pop. (1910) 133,953.

**Carlstad** (kärl'städ), a town, Sweden, on an island in Lake Wener, connected with the mainland by two bridges. Pop. 11,869.

**Carlstadt** (kärl'stät), ANDREAS RUDOLF BODENSTEIN, a German reformer, born in 1480; died in 1541. He was appointed professor of theology at Wittenberg in 1513. About 1517 he became one of Luther's warmest supporters. He was excommunicated by the bull against Luther, and was the first to appeal from the pope to a general council. While Luther was at the Wartburg Carlstadt instigated the people and students to the destruction of the altars and the images of the saints, greatly to the displeasure of Luther. In 1524 he declared himself publicly the opponent of Luther, and commenced the controversy respecting the sacrament, denying the bodily presence of Christ in the sacramental elements. This controversy ended in the separation of the Calvinists and Lutherans. After many misfortunes he settled as vicar and professor of theology at Basel, where he died.

**Carlyle** (kär-lil'), ALEXANDER, a Scotch Presbyterian minister, born in Dumfriesshire 1722; died at Inveresk 1805. He became minister of Inveresk in 1747, and was one of the leaders of the Moderate party in the church. He was present at the Porteous riot, served as a volunteer in the '45 rebellion, and was present at the battle of Prestonpans. He was intimate with all the most eminent Scotchmen of the day, and got into trouble with the presbytery for assisting at the production of Home's *Douglas*. In his old age he wrote an *Autobiography*, which was not published till 1860. It is a singularly interesting production, both from the vigor and sprightliness of its style and the pictures which it presents of Scottish society in the eighteenth century.

**Carlyle,** THOMAS, one of the greatest English writers of the last century, born December 4, 1795, at Ecclefechan, Dumfriesshire; died at Chelsea, Feb. 5th, 1881. He was the eldest son of James Carlyle, a mason, afterwards a farmer, and was intended for the church, with which object he was carefully educated at the parish school and afterwards at the burgh school of Annan. In his fifteenth year (in 1810) he was sent to the University of Edinburgh, where he developed a strong taste for mathematics. Having renounced the idea of becoming a minister, after finishing his curriculum (in 1814) he became a teacher for about four years, first at Annan, afterwards at Kirkcaldy. In 1818 he removed to Edinburgh, where he supported himself by literary work, devoted much time to the study of German, and went through a varied and extensive course of reading in history, poetry, romance, and other fields. His first literary productions were short biographies and other articles for the *Edinburgh En-*

Thomas Carlyle.

*cyclopædia*. His career as an author may be said to have begun with the issue in monthly portions of his *Life of Schiller* in the *London Magazine*, in 1823, this work being enlarged and published separately in 1825. In 1824 he published a translation of Legendre's *Geometry*, with an essay on proportion by himself prefixed. The same year appeared his translation of Goethe's *Wilhelm Meister's Apprenticeship*. He was next engaged in translating specimens of the German romance writers, published in 4 vols. in 1827. In 1827 he married Miss Jane Bailie Welsh, daughter of a doctor at Haddington, and a lineal descendant of John Knox. After his marriage he resided for a time in Edinburgh, and then withdrew to Craigenputtock, a farm in

Dumfriesshire belonging to his wife, about 15 miles from the town of Dumfries. Here he wrote a number of critical and biographical articles for various periodicals; and here was written *Sartor Resartus*, the most original of his works. The writing of *Sartor Resartus* seems to have been finished in 1831, but the publishers were shy of it, and it was not given to the public till 1833–34, through the medium of *Fraser's Magazine*. The publication of *Sartor* soon made Carlyle famous, and on his removal to London early in 1834 he became a prominent member of a brilliant literary circle embracing John Stuart Mill, Leigh Hunt, John Sterling, Julius Charles, Augustus William Hare, and F. D. Maurice, etc. He fixed his abode at Cheyne Row, Chelsea, where his life henceforth was mainly spent. His next work of importance was on the *French Revolution*, published in 1837. About this time, and on one or two subsequent years, he delivered several series of lectures, the most important of these, *On Heroes and Hero Worship*, being published in 1840. *Chartism*, published in 1839, and *Past and Present*, in 1843, were small works bearing more or less on the affairs of the time. In 1845 appeared his *Oliver Cromwell's Letters and Speeches, with Elucidations*, a work of great research, and brilliantly successful in vindicating the character of the great Protector. In 1850 came out his *Latter-Day Pamphlets*. This work was very repulsive to many from the exaggeration of its language, and its advocacy of harsh and coercive measures. He next wrote a life of his friend John Sterling, published in 1851, and regarded as a finished and artistic performance. The largest and most laborious work of his life, *The History of Friedrich II of Prussia, called Frederick the Great*, next appeared, the first two volumes in 1858, the second two in 1862, and the last two in 1865, and after this time little came from his pen. In 1866, having been elected Lord Rector of Edinburgh University, he delivered an installation address to the students *On the Choice of Books*. While still in Scotland the sad news reached him that his wife had died suddenly in London. This was a severe blow to Carlyle. Mrs. Carlyle, besides being a woman of exceptional intellect, was a most devoted and affectionate wife. From this time his productions were mostly articles or letters on topics of the day, including *Shooting Niagara;* and *After?* in which he gave vent to his serious misgivings as to the result of the Reform Bill of 1867. An unimportant historical sketch, *The Early Kings of Norway*, appeared in 1874, but was written long before. Towards the end of his life he was offered a government pension and a baronetcy, but declined both. He left the estate of Craigenputtock to the University of Edinburgh, settling that the income from it should form ten bursaries to be annually competed for—five for proficiency in mathematics and five for classics (including English). He had appointed James Anthony Froude his literary executor, who, in conformity with his trust, published *Reminiscences of Thomas Carlyle*, 1881; *Thomas Carlyle: the First Forty Years of his Life*, 1882; *Letters of Jane Welsh Carlyle*, 1883; and *Thomas Carlyle: Life in London*, 1884. The character of Carlyle presented in these volumes gave an unexpected shock to the public, and a bitter controversy has raged regarding Froude's conduct in the matter. Meantime the reputation of Carlyle has suffered somewhat, though time and further light may reinstate his fame on its former pedestal. Works published to assist in this are, *Early Letters of Thomas Carlyle*, edited by Ch. E. Norton (1886); and a new edition of the *Reminiscences* by same editor (1887); *Correspondence between Goethe and Carlyle* appeared the same year.

**Carmagnola** (kär-mä-nyō'lä), a town of N. Italy, 18 miles S. S. E. of Turin. It has the remains of a strong castle, and is noted for its annual silk fairs. Pop. of commune, 11,721.

**Carmagnole** (kär-mä-nyōl), a name applied in the early times of the French Republic (1792–93) to a highly-popular song (author and composer unknown), and a dance by which it was accompanied. The appellation afterwards became a sort of generic term for revolutionary songs.

**Carmarthen** (kär-mär'then), or CAERMARTHEN, a maritime county of South Wales, the largest of the Welsh counties; area, 947 sq. miles. It is of a mountainous character generally, and its valleys are noted for the beauty of their scenery. The principal river is the Tywi or Towy. The mineral products of the county are iron, lead, coal, and limestone. The chief towns are Carmarthen and Llanelly. Pop. 135,328.—CARMARTHEN, the county town, is situated 9 miles from the sea, on the Towy, which is navigable to its outlet in Carmarthen Bay. The town is well built, and as some parts of it have a considerable elevation it has a striking appearance when viewed from a distance. There are some

tin and lead works, cloth manufactories, and iron-foundries, and the salmon-fishery is extensive. Pop 10,025.

**Carmarthen Bay,** a bay of South Wales, opening from the Bristol Channel between Giltar Point and Worms Head; 17 miles across the entrance, and 9 miles from the line of entrance to the Towy's mouth.

**Carmel** (kär'mel), a range of hills in Palestine, extending from the Plain of Esdraelon to the Mediterranean, and terminating in a steep promontory on the south of the Bay of Acre. It has a length of about 16 miles, and its highest point is 1850 feet above the sea.—KNIGHTS OF MOUNT CARMEL, an order of 100 knights, each of whom could prove at least four descents of nobility by both father and mother, instituted by Henry IV of France.

**Carmelites** (kär'me-lītz), mendicant friars of the order of Our Lady of Mount Carmel. From probably the fourth century holy men took up their abode as hermits on Mount Carmel in Syria, but it was not till about the year 1150 that pilgrims established an association for the purpose of leading a secluded life on this mountain, and so laid the foundation of the order. Being driven by the Saracens to Europe in 1247, they adopted all the forms of monastic life and a somewhat milder rule. In time they became divided into several branches, one of them distinguished by walking barefooted. The habit of the order is of a dark-brown color, and over it is worn a white cloak with a hood.

Carmelite.

**Carmen Sylva,** pen name of Elizabeth, late Queen of Roumania (*q. v.*).

**Carminatives** (kar-min'i-tivs), medicines obtained chiefly from the vegetable kingdom, and used as remedies for flatulence and spasmodic pains. They are said to derive their name from the Latin word *carmen*, a song, a charm, from their often operating almost instantaneously, like a *charm*. They include peppermint, ginger, cardamoms, anise, caraway, etc.

**Carmine** (kar'mīn), the fine red coloring matter or principle of cochineal, from which it is prepared in several ways, the result being the precipitation of the carmine. It is used to some extent in dyeing, in water-color painting, to color artificial flowers, confectionery, etc. Other preparations get the same name.

**Carmona** (kär-mō'na), a town of Spain, in Andalusia, 20 miles E. N. E. of Seville. Among its edifices are a ruined fortress, a Gothic church with a lofty spire, a fine Moorish gateway, etc. Near the town a number of ancient rock-cut tombs have been opened up. Pop. 17,215.

**Carnac** (kär-nak'), a village of Brittany, France, dep. of Morbihan, on a height near the coast, 15 miles S. E. of Lorient, and remarkable for the so-called Druidical monuments in its vicinity. These consist of eleven rows of unhewn stones, which differ greatly both in size and height, the largest being 22 feet above ground, while some are quite small. These avenues originally extended for several miles, but many of the stones have been cleared away for agricultural improvements. They are evidently of very ancient date, but their origin is unknown. For Karnak see *Thebes*.

**Carnahuba.** See *Carnauba*.

**Carnallite** (kar'nal-īte), a potassic mineral, a double chloride of magnesium and potassium, found at Stassfurt in Prussia, and elsewhere, yielding potassic chloride, which is used as a fertilizing agent, and magnesium chloride.

**Carnaria.** Same as *Carnivora*.

**Carnarvon** (kar-när'von), or CAERNARVON, a maritime county of North Wales, forming the N. W. extremity of the mainland; area, 565 sq. miles. It is traversed by lofty mountains, including the Snowdon range, whose highest peak is 3571 feet, and the highest mountain in South Britain. There are other summits varying from 1500 feet to more than 3000 feet. Lakes are numerous, but the only river of importance is the Conway, which separates

the county from Denbighshire. Slate is the chief mineral, large quantities of which are exported. Although the most mountainous county in Wales, there are many tracts of low and fertile land, but the arable area is small. Pop. 125,049. —CARNARVON, the county town, is a seaport and parliamentary borough (joining with Conway, Bangor, Pwllheli, Nevin, and Criccieth), on the S. E. side of the Menai Strait. The old part of the town is surrounded by an ancient wall. The magnificent castle or palace of Edward I, and in which Edward II was born, stands at the W. end of the town, almost overhanging the sea, and is still externally entire. Carnarvon is a sea-bathing resort, and the shipping trade is considerable. Pop. 9119.

**Carnatic** (kar-nat'ik), the district in Southeastern India, extending from Cape Comorin to the Northern Circars, lying east of the Ghats, and reaching to the sea on the Coromandel coast. It is now included in the Presidency of Madras.

**Carnation** (kar-nā'shun; from L. *caro, carnis*, flesh). In the fine arts, flesh color; the parts of a picture which are naked or without drapery, exhibiting the natural color of the flesh.

**Carnation,** the popular name of varieties of *Dianthus caryophyllus*, the clove-pink. The carnations of the florists are much prized for the beautiful colors of their sweet-scented double flowers. They are arranged into three classes according to color, viz., *bizarres*, which have at least three colors; *flakes*, which have two colors, with large stripes through leaves; and *picotees*, which are smaller than the above named, and have serrated flowers, of which the colors are yellow with white spots.

**Carnauba** (kár-ná-ŏ'bá), the Brazilian name of the palm *Corypha cerifĕra*, which has its leaves coated with waxy scales, yielding by boiling a useful wax. The fruit and pith are eaten, the leaves are variously employed, and the wood in building.

**Carnegie** (kar-neg'ē), ANDREW, iron manufacturer, was born at Dunfermline, Fifeshire, Scotland November 25, 1835, whence his father, a hand-loom weaver, emigrated to the United States in 1848. The family settled in Pittsburgh, where Andrew obtained employment first in a cotton factory; afterwards became a telegrapher. A fortunate acquaintance with Woodruff, the sleeping-car patentee, laid the foundation of his success; then came lucky ventures in oil and the starting of a rolling mill from which has grown the largest system of iron and steel industries in the world. He retired from business in 1901, retaining an interest valued at several hundred millions of dollars in the United States Steel Corporation. He gave large sums to the establishment of public libraries in the United States and abroad. In addition he donated $10,000,000 to the Carnegie Institute at Pittsburgh, equal sums to the Carnegie Institute at Washington, to the universities of Scotland, to establish a pension fund for teachers of the higher educational institutions, and to aid in the establishment of international peace. He also gave a smaller sum for a hero fund. In 1911 he established the Carnegie Corporation (which see). He has published various works. *Triumphant Democracy*, *The Gospel of Wealth*, *The Empire of Business*, etc.

**Carnegie Corporation,** an institution founded in New York by Andrew Carnegie in 1911. Its purpose is that of receiving and maintaining funds for the purpose of aiding technical schools, institutions of higher learning, libraries, scientific research, hero funds, useful publications, etc. In 1912 Mr. Carnegie announced that he had given all his fortune, with the exception of $25,000,000, to promote the purposes of this corporation.

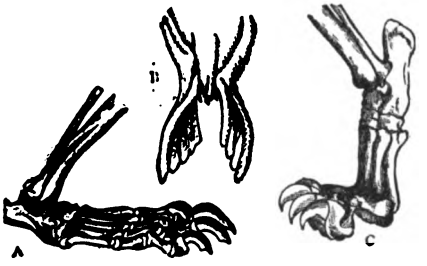
**Carnegie Hero Trust,** a fund of $5,000,000 created by Andrew Carnegie in 1904, for the benefit of the dependents of those losing their lives in heroic effort to save their fellow men, or for the heroes themselves if only injured. The fund applies only to acts performed within the three countries, United States, Canada and Newfoundland, and their included waters. A purpose, as outlined by Mr. Carnegie, is to place those who have been injured in an heroic effort in somewhat better conditions pecuniarily than before, until able to work again. Provision was also made for medals to be given in commemoration of heroic acts.

**Carnegie Institution, The,** of Washington, founded by Andrew Carnegie, was incorporated January 4, 1902. The endowment and the conduct of the Institution were entrusted to a self-perpetuating board of 27 trustees chosen by the founder. The purpose of the Institution is to encourage investigation, research and discovery, and in furtherance of this purpose stipends and scholarships are provided.

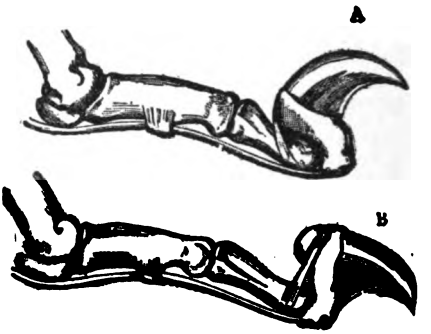
**Carnegie Peace Fund,** a fund of $10,000,000 donated by Andrew Carnegie, Dec. 24, 1910, to be devoted to the establishment of universal peace by the abolition of war between the nations and such international friction as may impair the happiness and progress of mankind. This fund is controlled by a board of trustees.

**Carnival** (kär'ni-val), the feast or season of rejoicing before Lent, observed in Catholic countries with much revelry and merriment. The name comes from Low Latin *carnelevāmen*, for *carnis levāmen*, solace of the flesh or body, feasting permitted in anticipation of any fast. Carnival observances have much declined, but in some of the cities of Italy, especially Rome, Milan, and Naples, it is still a great popular festival, as well as in some parts of Germany. Some have thought the carnival mainly a survival of the pagan Saturnalia of the Romans, which it much resembles in many of the usages.

**Carnivora** (kär-niv'o-ra), a term applicable to any creatures that feed on flesh or animal substances, but now applied specially to an order of mammals which prey upon other animals. The head is small, the jaws powerful, and the skin is well covered with hair. Two sets of teeth, deciduous or milk and permanent, are always developed in succession, and in both sets incisors, canines, and molars are distinguishable. The stomach is simple and the alimentary canal short, thus making the body as light and slender as possible for the purpose of hunting and springing on its prey. The muscular activity of the carnivora is very great, their respiration and circulation very active, and their demand for food is consequently constant. Carnivora are often divided into Plantigrada, comprising the bears, badgers, raccoons, etc.; Digitigrada, comprising lions, tigers, cats, dogs; and Pinnipedia or Pinnigrada, comprising the seals and walruses. The two former divisions are also classed together as Fissipedia. The typical Plantigrada are distinguished by their putting the whole sole of the foot to the ground in walking, while the Digitigrada walk on the tips of their toes. The Plantigrada are also less decidedly carnivorous, and feed much on roots, honey, and fruits. In the Pinnigrada the body is long and of a fish shape, the fore and hind limbs are short and expanded into broad-webbed swimming-paddles. The hind feet are placed far back, and more or less tied down to the tail by the integuments.



Feet of Carnivora (after Owen). A, *Plantigrada*, Foot of Bear; B, *Pinnigrada*, Hind feet of Seal; C, *Digitigrada*, Foot of Lion.



Bones and Ligaments of Cat's Toe. A. Claw retracted. B. protruded.

**Carnot** (kär-nō), Lazare Nicolas Marguerite, a French statesman, general, and strategist, was born in 1753, and died in 1823. When the revolution broke out he was captain in the corps of engineers. In 1791 he was appointed deputy to the constituent assembly. In the following March he was sent to the Army of the North, where he took command and successfully repulsed the enemy. On his return he was made member of the Committee of Public Safety, and directed and organized the French armies with great ability and success. As a member of the Committee Carnot was formally responsible for the decrees of Robespierre, but being incessantly occupied in his department knew really little of the atrocities to which the sanction of his name was lent. In 1797 Carnot, having unsuccessfully opposed Barras, had to escape to Germany, but returned, and was appointed

minister of war by Napoleon (1800). But he remained in principle an inflexible republican, voted against the consulship for life, and protested against Napoleon's assumption of the imperial dignity. In 1814 Napoleon gave him the chief command at Antwerp, and in 1815 the post of minister of the interior.—A grandson of his, MARIE FRANÇOIS SADI, born in 1837, was elected president of the French republic in 1887. He was assassinated June 24, 1894, by an Italian anarchist, in the city of Lyons, France.

**Caro** (kâ'rō), ANNIBALE, one of the most celebrated Italian authors of the 16th century, born 1507, died 1566. He was secretary to several members of the great Farnese family. He devoted himself to numismatics and the Tuscan language, and became famous for the purity and elegance of his style. Among his works are translations of the *Æneid* and of Aristotle's *Rhetoric*.

**Carob-tree,** or ALGAROBA-BEAN (*Ceratonia siliqua*), a leguminous plant of the suborder Cæsalpinieæ, growing wild in all the countries on the Mediterranean. It has a dark-green foliage, and produces pods in which the seeds are embedded in a dry, nutritious pulp of a sweet taste. The names *locust-beans* and *St. John's bread* have been given to the legumes of this plant, from an idea that they were the food eaten, along with wild honey by the Baptist in the wilderness. In the south of Europe they are principally used as food for horses, and they are imported into Britain as a food for cattle.

**Carol** (kăr'ol), a song, especially one expressive of joy. It often signifies, specifically, a religious song or ballad in celebration of Christmas, such as are sung about Christmastide in English churches or by 'waits' out of doors.

**Carolina Pink** (kar-o-lī'na), a name given to the *Spigelia Marylandica*, a North American plant bearing scarlet flowers, with orange centers, and having a root used as a vermifuge.

**Caroline,** a British queen, was a daughter of the Duke of Brunswick-Wolfenbüttel, born May 17, 1768. In 1795 she was married to the Prince of Wales, afterwards George IV. The marriage was not to his liking, and after the birth of the Princess Charlotte he separated from her. Many reports were circulated against her honor, and a ministerial committee formed to inquire into her conduct. But the people in general sympathized with her, regarding her as an ill-treated wife When the Prince of Wales ascended the throne in 1820 he offered her an income of $250,000 on condition that she would never return to England from the continent where she was then living. She refused and in June of the same year entered London amid public demonstrations of welcome. The government now instituted proceedings against her for adultery, but the public feeling and the splendid defense of Brougham obliged the ministry to give up the Divorce Bill after it had passed the Lords. Though banished from the court, the queen now assumed a style suitable to her rank. She died 7th Aug. 1821.

**Caroline Islands,** or NEW PHILIPPINES, a large archipelago, North Pacific Ocean, between lat. 3° and 12° N. and lon. 132° and 163° 6′ E., and between the Philippines and the Marshall Isles, first discovered by the Spaniards in 1543, if not by the Portuguese in 1525. Many of the islands are mere coral reefs little elevated above the ocean. They form many groups, the most important being the Pelews, and those to which the largest islands of all, Yap and Ponape, respectively, belong. The pop. is estimated at 20,000, made up of people of different races and stages of civilization. The most important vegetable productions are palms, bread-fruit trees, and bananas. The natives show great skill in constructing their canoes and building their houses. There is an American Protestant and a Roman Catholic mission. Some trade is carried on at Yap and Ponape. The islands were owned by Spain, but were sold to Germany in 1899; in 1885 war nearly arose when the latter country proposed to occupy Yap.

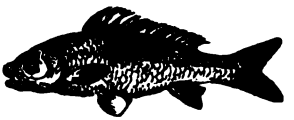
**Carolingian.** See *Carlovingian*.

**Carolus** (kar'o-lus), a gold coin struck in the reign of Charles I, and originally 20*s*. in value, afterwards 23*s*. The name was given also to various other coins.

**Carotid** (ka-rot'id) ARTERIES, the two great arteries which convey the blood from the aorta to the head and the brain. The *common carotids*, one on either side of the neck, divide each into an external and an internal branch. The *external carotid* passes up to the level of the angle of the lower jaw, where it ends in branches to the neck, face, and outer parts of the head. The *internal carotid* passes deeply into the neck, and through an opening in the skull behind the ear enters the brain, supplying it and the eye with blood. Wounds of the carotid trunks cause almost immediate death.

**Carouge** (kä-rözh), a town of Switzerland, on the Arve, near Geneva, with which it is connected by a bridge. It has manufactures of iron goods, watches, etc. Pop. 7400.

**Carp** (*Cyprinus*), a genus of soft-finned abdominal fish (type of the family Cyprinidæ), distinguished by the small mouth, toothless jaws, and gills of three flat rays. It has but one dorsal fin, and the scales are generally of large size. It frequents fresh and quiet waters, feeding chiefly on vegetable



Carp (*Cyprinus carpio*).

matters, also on worms and molluscs. The common carp (*C. carpio*) is olive-green above and yellowish below, and in many parts is bred in ponds for the use of the table. It sometimes weighs many pounds, is of quick growth, and spawns thrice a year. It is said to live to the great age of 100 or even 200 years. This remarkable fish moves 4386 bones and muscles each time it breathes; it has 4320 veins and 99 muscles. The gold-fish, *C. aurātus*, was originally from China.

**Carpaccio** (kär-päch'ō), VITTORE, Italian painter, one of the most celebrated masters of the old Venetian school, was born probably at Venice about 1450–55, and died there after 1521. His distinguishing characteristics are natural expression, vivid conception, correct arrangement, and great variety of figures and costumes. He also excelled as an architectural and landscape painter. Scriptural subjects were also depicted by him.

**Carpathian** (kär-pā'thi-an) MOUNTAINS, German, *Karpathen*), a range of mountains in Southern Europe, chiefly in Austria, forming a great semicircular belt nearly 800 miles in length. The Carpathian chain may be divided into two great sections—the West Carpathians, in Hungary to the northwest, and the East Carpathians, in Transylvania, to the southeast, with lower ranges stretching between. To the Western Carpathians belongs the remarkable group of the Tatra. The greatest height of the East Carpathians is Ruska-Poyana, 9909 feet; of the West Carpathians, the Eisthalerspitze, 8521 feet; many other peaks have an elevation over 8000 feet. The outer bend of the Carpathians is much steeper than that which descends towards the valleys of Transylvania and Hungary. The only important rivers which actually rise in the chain are the Vistula, the Dniester, and the Theiss. The Carpathian range is rich in minerals, including gold, silver, quicksilver, copper, and iron. Salt occurs in beds, which have sometimes a thickness of 600 or 700 feet. On the plateaux corn and fruit are grown to the height of 1500 feet. Higher up the mountain steeps are covered with forests of pine. There is much remarkable scenery.

**Carpel** (kar'pel), in botany, a single-celled ovary or seed-vessel, or a single cell of an ovary or seed-vessel, together with what belongs to that cell, as in many cases a separate style and stigma of the pistil. The pistil or fruit often consist of only one carpel, in which case it is called *simple;* when either consists of more than one carpel it is called *compound.* A carpel is regarded as a modified leaf.

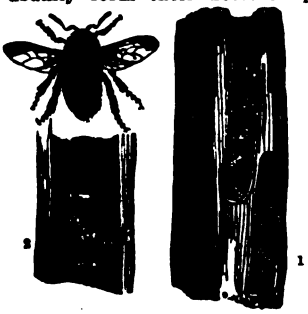
**Carpentaria** (kär-pen-tā'ri-a), GULF OF, a large gulf on the north coast of Australia, having Cape York Peninsula, the northern extremity of Queensland, on the E., and Arnhem Land on the W.

**Carpenter** (kar'pen-tėr), FRANCIS BICKNELL, artist, born at Homer, New York, in 1830; died 1900. He painted well-known portraits of Presidents Fillmore and Lincoln and the historical subject *Signing the Emancipation Proclamation.* He wrote *Six Months in the White House with Abraham Lincoln.*

**Carpenter,** WILLIAM BENJAMIN, an English physiologist, born in 1813; died in 1885. He studied medicine at University College, London, and at Edinburgh University, subsequently held several lectureships in London, and ultimately became registrar at London University (1856–79). He wrote several well-known works on physiology: *Principles of General and Comparative Physiology; Principles of Mental Physiology; Principles of Human Physiology; Manual of Zoology,* etc. He took a leading part in the expeditions sent out by government in 1868–70 for deep-sea exploration in the North Atlantic. He was chosen president of the British Association at Brighton in 1872.

**Carpenter-bee,** the common name of the different species of hymenopterous insects of the genus *Xylocopa.* The species are numerous in Asia, Africa, and America, and one species inhabits the south of Europe. They are generally of a dark violet blue, and of considerable size

They usually form their nests in pieces



Carpenter-bee (*Xylocŏpa violacea*), half the natural size.

1, A piece of wood bored by the bee, and grubs and food deposited in the cells. 2, Two of the cells drawn larger in order to show the partitions.

of half-rotten wood, cutting out various apartments for depositing their eggs.

**Carpentras** (kär-pän-trä), a town, Southern France, dep. Vaucluse, 14 miles N. E. of Avignon, surrounded by walls flanked with towers. It is an ancient town, and has a Roman triumphal arch, an aqueduct, etc. Pop. 7775.

**Carpentry** (kar'pen-tri) is the art of combining pieces of timber to support a weight or sustain pressure. The work of the carpenter is intended to give stability to a structure, that of the joiner is applied to finishing and decoration. An explanation of some of the terms employed in carpentry may be useful. The term *frame* is applied to any assemblage of pieces of timber firmly connected together. The points of meeting of the pieces of timber in a frame are called *joints*. *Lengthening* a beam is uniting pieces of timber into one length by joining their extremities. When neatness is not required this is done by *fishing*, that is, placing a piece of timber on each side of where the beams meet and securing it by bolts passed through the whole. When the width of the beam must be kept the same throughout *scarfing* is employed. This is cutting from each beam a part of the thickness of the timber, and on opposite sides, so that the pieces may be jointed together and bolted or hooped. When greater strength is required than can be produced by a single beam *building* and *trussing* beams are resorted to. Building beams is combining two or more beams in depth so as to have the effect of one. In trussing the beam is cut in two in the direction of its length, and supported with cross-beams, as in roofing. *Mortise* and *tenon* is a mode of jointing timber. An excavation called the mortise is made in one piece, and a projecting tongue to fit it called the tenon in the other. The timber framework of floors is called *naked flooring*, and is *single* if there be but a single series of joists, *double* if there are cross-binding joists, and *framed* if there are girders or beams in addition to the joists. The *roof* is the framework by which the covering of a building is supported. It may consist of a series of sloping pieces of timber, with one end resting on one wall and the other end meeting in a point with a corresponding piece resting on the opposite wall: these are called *rafters*. There is usually a third piece which connects the lower extremities of the rafters and prevents them from spreading. This is called a *tie*, and the whole frame a *couple*. The principal instruments used in carpentry are saws, as the circular-, band-, and tenon-saws; planes, as the jack-plane, smoothing-plane, molding-plane, etc., chisels, gouges, brad-awls, gimlets, etc. See *Saw* and *Plane*.

**Carpet** (kar'pet), a thick fabric, generally composed wholly or principally of wool, for covering the floors of apartments, staircases, and passages in the interior of a house. They were originally introduced from the East, where they were fabricated in pieces, like the modern rugs, for sitting on—a use obviously suggested by the Eastern habit of sitting cross-legged upon the floor. Eastern carpets are still highly thought of in Europe, into which they are largely imported. The Persian, Turkish, and Indian carpets are all woven by hand, and the design is formed by knotting into the warp tufts of woolen threads of the proper color. Of carpets made in this country and Europe *Brussels* carpet is a common and highly-esteemed variety. It is composed of linen thread and worsted, the latter forming the pattern. The linen basis does not appear on the surface, being concealed by the worsted, which is drawn through the reticulations and looped over wires that are afterwards withdrawn, giving the surface a ribbed appearance. *Wilton* carpets are similar to Brussels in process of manufacture, but in them the loops are cut open by using wires with a knife-edge, and the surface thus gets a pile. *Tapestry* carpets have also a pile surface. They are made in a manner similar to that in which Brussels and Wilton carpets are manufactured; but only one yarn is used instead of five or more of different colors, as in the carpets just named. The *Kidderminster* or *Scotch* carpet consists of

two distinct webs woven at the same time and knitted together by the woof. The pattern is the same on both sides of the cloth, but the colors are reversed. An improvement upon this is the three-ply carpeting, made originally at Kilmarnock. The original *Axminster* carpets were made on the principle of the Persian or Turkish carpets. Axminster carpets, made in one piece to suit the size of the room, have a fine pile, which is produced by using chenille as the weft, the projecting threads of which form the pile, which is dyed before being used. *Tapestry* carpets are made of particolored yarns, by an ingenious process patented in 1832. They resemble the Brussels, except that each thread is of several colors. It is really a printed carpet, though the printing is confined to the warp yarns, which are so handled as to be printed in different colors by dyeing bands of various widths, according to the pattern. In weaving this pattern is brought out. Carpets of felted wool, with designs printed on them, are also used, and are very cheap. Philadelphia is the leading carpet-manufacturing city in the United States.

**Carpet-bagger,** a term applied after the Civil war to needy adventurers of the Northern States of America who tried in this way to gain the votes of the negroes of the Southern States, taking nothing with them, as was sarcastically said, but what they could carry in a carpet-bag.

**Carpi** (kär'pē), a town of Northern Italy, 9 miles N. of Modena, seat of a bishopric, suffragan to Bologna. Pop. 7118.—It is also the name of a village in the province of Verona, near which Prince Eugene defeated the French in 1701.

**Carpinus** (kär-pī'nus). See *Hornbeam.*

**Carpocratians** (kär-po-crā'shi-ans), a sect of Gnostics of the 2d century, so called from *Carpocrates*, a prominent teacher of gnosticism. They maintained that only the soul of Christ went to heaven, that his body would have no resurrection, and that the world was made by angels

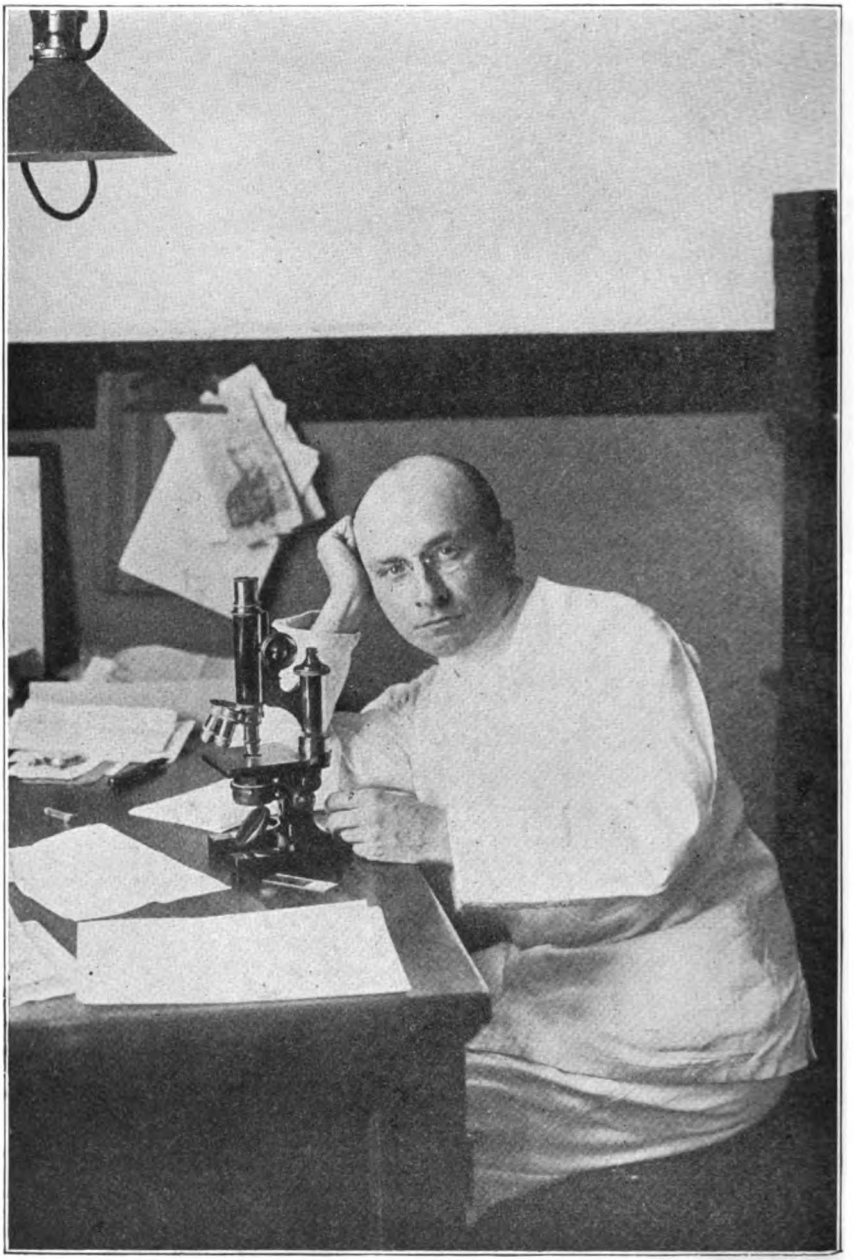
**Carpolites** (kar'pō-līts), a term applied to fossils of the nature of fruits, usually found in the Carboniferous system. Their exact place in the vegetable kingdom has not yet been determined.

**Carpus** (kar'pus), in anatomy, the bones between the forearm and hand, the wrist in man, or corresponding part in other animals.

**Carracci** (kär-rach'ē), LUDOVICO, AGOSTINO, and ANNIBALE, the three founders of the Bologna, or, as it has been called, the eclectic, school of painting.—LUDOVICO (lō-do-vē'kō) was born in 1555 at Bologna. At Florence he studied under Andrea del Sarto, and afterwards went to Parma for the purpose of studying Correggio, who was then imitated by almost all the Florentine painters. He then set up a studio in Bologna and established a school of painting characterized particularly by its attention to composition and its principle of eclecticism, or endeavor to imitate and unite the chief excellencies of different great masters, the drawing of Raphael, the coloring of Titian, etc. To assist him Ludovico had his two younger cousins, Agostino and Annibale, educated as artists; and after the completion of their studies all three by their able work soon made a high reputation for the academy of the Carracci at Bologna. Ludovico has left many works, the finest of which are in the Pinacoteca at Bologna. He died in 1619.—AGOSTINO (ā-gos-tē'nō) was born in 1558 at Bologna; he died at Parma in 1601. He engraved more pieces than he painted, though some of his pictures were admired by contemporaries even more than those of his brother Annibale—ANNIBALE (ān-nib'ā-lā) was born in 1560 at Bologna. In 1600 he was invited by Cardinal Farnese to Rome, where the influence of Raphael and Michel Angelo's work tempered the characteristics he had acquired from the Lombard and Venetian schools. His chief work is the series of frescoes for the Farnese Palace at Rome, which kept him eight years. He is generally considered the greatest of the Carracci. He died at Rome in 1609.

**Carrageen, Carragheen** (kar'ra-gēn), *Chondrus crispus*, a sea-weed very common on rocks and stones on every part of the coast of Britain. It is a very variable weed, with a flat, branching frond usually of a deep purple-brown color. When dried it becomes whitish, and in this condition is known as Irish-moss, and is used for making soups, jellies, size, etc. The name comes from Carragaheen, near Waterford, Ireland, where it abounds.

**Carranza,** VENUSTIANO, President de facto of Mexico, was a descendant of an old Spanish family, a native of the State of Coahuila. His ancestors had gained large agricultural possessions and he inherited an ample estate. For ten or fifteen years he had been a senator from Coahuila, though independent of and strongly opposed to the Diaz



*Photograph by Brown Bros.*

**ALEXIS CARREL**

**Winner of the Nobel prize in 1912 for the most useful advance made in medicine during the previous year.**

political machine. When he subsequently sought the governorship Madero became an orator in his support, but Diaz used his influence against him and not until Madero became president did Carranza win the office. The assassination of Madero brought Carranza into the field as a revolutionist against Huerta, whom he accused of having murdered his friend.

In the war that followed, Carranza took no military part, though he was the acknowledged head of the movement; and when success came, through the influence of the revolutionary generals, and that of the administration at Washington, Carranza became the president by virtue of the success of his army. A popular election was deferred till a later date. As President he strongly opposed the occupation of northern Mexico by a force of United States soldiers and showed himself a loyal and earnest citizen of Mexico and a man of considerable diplomatic and statesmanlike ability.

**Carrara** (kär-rä'ra), a city of Northern Italy, 59 miles s. w. of Modena, a few miles from the coast, with some interesting buildings, including an old church, an academy of sculpture, etc. It is surrounded by hills which contain fine white statuary marble, in the preparation of which and commoner sorts most of the inhabitants are occupied. Pop. 49,492.—The Carrara marble was formerly supposed to be a primitive limestone, but is now considered an altered stone of the Oolitic period. Although the quarries have been worked for 2000 years, they are still practically inexhaustible. They employ 6000 or 7000 men.

**Carrara** (kär-rä'ra), FRANCESCO, an Italian specialist and writer *pratica legislativa penale* (1882, 2nd edition criminal law, born in Lucca in 1805. He held an instructorship in criminal law at the university of Pisa, was a deputy 1865–70, a senator from 1876. Was forced to leave public life because of blindness. His most important work is *Programma del corso di diritto criminale* (13 vols., published 1879–86). Other publications are *Opuscoli di diritto criminale* (7 vols., 1878–80), and *Lineamenti di pratica legislativa penale* (1882, 2nd ed.).

**Carrel** (kär-rel), ALEXIS, a famous surgeon, born at Sainte Foy les Lyon, France, June 28, 1873; studied at the University of Lyon, receiving his M.D. degree in 1900. He was connected with the University of Lyon until 1905, when he came to America. Since 1909 he has been an associate member of the Rockefeller Institute for Medical Research. See *Tissues, Vascular Surgery, Wounds.* His astounding demonstration that animal tissues, even some of the vital organs, can be kept alive indefinitely after they have been removed from the body, brought him, in 1912, the Nobel prize for the most useful advance made in medicine during the previous year. His discoveries have exerted more far-reaching influence in the fields of medicine and surgery than any since Harvey's discovery of the circulation of the blood. See *Antiseptic.*

**Carrel,** NICOLAS ARMAND, a French republican writer, born in 1800. For some years he was an officer in the army, but later settled in Paris, and acquired a reputation as an essayist and contributor to the leading opposition papers. In 1827 he published a history of the English revolution of 1688, and in 1830 united with Thiers and Mignet in editing the *National*, which soon rose to be the leading newspaper in opposition to the government of Charles X. After the revolution his colleagues joined the government of Louis Philippe, and he was left with the chief direction of the paper, which still continued in opposition. In 1832 the *National* became openly republican and enjoyed great popularity. Carrel was killed in 1836; in a duel with Emile de Girardin.

**Carreno** (kä-rā'nyō), TERESA. A well-known Venezuelan pianist who was born in Caracas in 1853. She studied first under her father, who was an amateur musician of ability, then in New York and Paris and has played with great success in both Europe and America. Her playing is noted for its dash and brilliancy and for its masculine power. She has many talents and has made notable successes as a composer, singer and on one occasion as conductor of the orchestra during a great opera performance. Madame Carreño has had a number of matrimonial ventures and after having married and divorced three husbands, married the younger brother of her second husband.

**Carrer** (kär'rĕr), LUIGI, an Italian poet, born in Venice in 1801, died 1850. Though he was educated as a lawyer, he followed a natural bent toward literature and after a short time spent in a printing office he entered scholastic life as secretary of the Institute Veneto, became a professor of belles-lettres at the Scuola Tecinca and afterward Director of the Museo Carrer. His works include ballads, critical and biographical essays, etc.

**Carrera** (kär-rā'ra), JOSÉ MIGUEL, a Chilean revolutionist and principal leader in the early struggles for the independence of Chile. He was born in 1785 at Santiago de Chile. Going

to Spain he fought through the Napoleonic wars in the Spanish Army but in July, 1811, on the outbreak of the revolution in Chile returned and managed to place himself at the head of a new government with the support of the army. On December 2, 1811, he announced himself as Dictator and until 1813 he was active in endeavoring to establish a stable government, pushing military operations, settling questions concerning rents, promoting election. In 1813 he was forcibly deposed by the Junta and Bernardo O'Higgins appointed to succeed him. He resisted this change with deep resentment and though seeming to co-operate with O'Higgins at the battle of Rancagua in 1814 his rivalry with him led to the defeat of the Nationalist forces. Carrera then fled to the United States where he attempted to secure materials for a fresh revolutionary movement. On his return in 1816, he was stopped by the Argentine government and on his attempting to organize a revolt there he was captured and executed at Mendoza, September 4, 1821. In later years his worth came to be better appreciated and a bronze monument was erected to his memory in Santiago, Chile.

**Carrère** (kâ-rār'), JOHN MERVEN, an American architect born in Rio de Janeiro, November 7, 1858, of American parents. He studied in Switzerland and Paris, at the Ecole des Beaux Arts, where he met Thomas Hastings with whom he afterward formed a partnership as "Carrère and Hastings." The work of this firm soon acquired a high reputation for excellence and plans for many important buildings were executed by them including the Edison, the Mail and Express Buildings in New York, the Senate Office Building at Washington, a number of important buildings for the St. Louis Exposition held at St. Louis in 1904 but most notable was the commission for the New York Public Literary erected at a cost of $8,000,000. He died March 1, 1911.

**Carrhæ** (kär'rē), the site of an ancient city in Northwestern Mesopotamia, the Haran of the Bible.

**Carriage** (kar'ij), a general name for a vehicle, but more especially for one of the lighter and more ornamental kinds. See *Coach*, where the chief kinds are referred to.

**Carrick** (kar'rik), the southern district of the county of Ayr, Scotland. The Prince of Wales bears the title of Earl of Carrick.

**Carrickfergus** (kar-rik-fer'gus), a seaport of Ireland, County Antrim, formerly a parliamentary borough, 11 miles by railway N. E. of Belfast. It is memorable as the landing place of King William III, 14th June, 1690. The castle stands upon a rock projecting into the bay, and is still maintained as a fortress. There are some manufactures, principally linen, and extensive fisheries. Pop. 10,000.

**Carrick-on-Suir,** a town of Ireland, County Tipperary, 85 miles S. W. of Dublin, on the left bank of the Suir, navigable here by small vessels; it has a considerable trade in agricultural produce. Pop. about 6000.

**Carrick,** PURSUIVANT. See *Herald.*

**Carrier** (kar'i-er), is a person who undertakes to transport the goods of other persons from place to place for him. Persons who undertake this as a systematic business are called *common carriers*, and come under special legal regulations, such as that they shall be responsible for the goods entrusted to them so long as in their custody.

**Carrier** (kâr-yā), JEAN BAPTISTE, an infamous character of the first French revolution, born 1746; executed 1794. Though an obscure attorney he was chosen, in 1792, a member of the national convention. In Oct., 1793, he was sent to Nantes to suppress the civil war. The prisons were full; there was dearth of provisions, and Carrier determined to lessen the 'useless mouths' by summary measures. He first caused ninety-four priests to be conveyed to a boat with a perforated bottom, under pretense of transporting them, but instead had them drowned by night. This artifice was repeated a number of times, while Carrier also caused multitudes of prisoners to be shot without any pretense of trial. Some months before the fall of Robespierre, Carrier was recalled. On the 9th Thermidor (July 27), 1794, he was apprehended and brought before the revolutionary tribunal, which condemned him to the guillotine.

**Carrier Pigeon,** a variety of the common domestic pigeon used for the purpose of carrying messages. The real carrier pigeon is a large bird with long wings, a large tuberculated mass of naked skin at the base of the beak, and a circle of naked skin round the eyes, but the variety generally employed to carry messages more resembles an ordinary pigeon. The practice of sending letters by pigeons belongs originally to Eastern countries, though in other countries it has often been adopted, more especially before the invention of the electric telegraph. An actual post-system in which pigeons were the messengers was established at Bagdad by the Sultan Nureddin Mahmud, who died in 1174, and lasted till 1258, when Bagdad fell into the hands of the Mongols.

and was destroyed by them. These birds can be utilized in this way only in virtue of what is called their "homing" faculty or instinct, which enables them to find their way back home from surprising distances. But if they are taken to the place from which the message is to be sent and kept there too long, say over a fortnight, they will forget their home and not return to it. They are tried first with short distances, which are then gradually increased. The missive may be fastened to the wing or the tail, and must be quite small and attached so as not to interfere with the bird's flight. By the use of microphotography a long message may be conveyed in this way, and such were received by the besieged residents in Paris during the Franco-Prussian war of 1870–71, the birds being conveyed out of the city in balloons, Seventy-two miles in two and a half hours, a hundred and eighty in four and a half, have been accomplished by carrier pigeons. Large numbers of these birds are now kept in England, Belgium, France, etc., there being numerous pigeon clubs which hold pigeon races to test the speed of the birds. These pigeons are also kept in several European countries for military purposes.

**Carroll** (kar'ol), the name of three patriots distinguished in early American history. 1. CHARLES, of Carrollton, born at Annapolis, Md., in 1737: educated in France; finished his law studies in England, and returned to America in 1764. From the following year on he was active in Maryland politics and in restoring religious liberty in the colony. In 1776 he was one of the commission sent to Quebec to enlist the help of Canada in behalf of the Revolution. The same year he was elected a delegate to the Continental Congress, and signed the Declaration of Independence, sacrificing more than anyone else, as he was the richest man in America, and he won over the Catholics of his State to support the patriot cause. Elected U. S. Senator in 1789. His last public act was the laying of the cornerstone of the Baltimore and Ohio Railroad, July 4, 1828. The last survivor of the signers, he died Nov. 14, 1832.—2. DANIEL, his cousin, also born in Maryland, died at a great old age in 1829. He was a member of the Confederation Congress, 1780–84, a delegate to the Constitutional Convention of 1787, a representative in Congress, 1789–91, and in the latter year was appointed on the commission to survey the District of Columbia. His farm was the site of the city of Washington.—3. JOHN, first Catholic bishop in the United States, another cousin of Charles, was born in Maryland 1735, joined the Jesuit order in 1771, and was appointed bishop of Baltimore 1789. In 1808 he became the first archbishop in this country, and died in 1815.

**Carrot** (kar'ot; *Daucus carōta*), a biennial umbelliferous plant. In gardens there are three chief varieties. The leaves are tripinnate, of a handsome feathery appearance. The plant rises to the height of 2 feet, and produces white flowers. The root, in its wild state, is small, tapering, of a white color, and strong flavored; but that of the cultivated variety is large, succulent, and of a red, yellow, or pale-straw color, and shows remarkably the improvement which may be effected by cultivation. It is cultivated for the table and as a food for cattle. Carrots contain a large proportion of saccharine matter, and attempts have been made to extract sugar from them. They have been also employed in distillation; 10 pounds weight of carrots will yield about half a pint of very strong ardent spirit. The Peruvian carrot is *Aracācha esculenta*. See *Aracacha*.

Carrot.

**Carse** (kârs), a word of uncertain origin, applied in Scotland to a tract of fertile alluvial land along the side of a stream.

**Carson** (kar'son), CHRISTOPHER, commonly known as Kit Carson, was born in Kentucky in 1809, died 1868. He became famous as a trapper and guide, passing a great part of his time in the Rocky Mountains and adjacent territories. He rendered important service to Fremont in his explorations. In 1847 he was made a lieutenant in the rifle-corps of the army.

**Carson,** SIR EDWARD HENRY, lawyer and statesman, leader of the Ulster Loyalist party opposed to Home Rule for Ireland, was born in Dublin February 9, 1854. He was solicitor general for Ireland in 1892 and was a member of the British cabinet during the European war. He was attorney general in 1915 and for a short time first lord of the Admiralty. He resigned from the cabinet in January, 1918, to give his attention to Irish affairs.

**Carson City,** the capital of Nevada, situated at the foot of the Sierra Nevada Mountains, 3 miles

from Carson River. It was founded in 1858, in consequence of the rich silver and gold finds in that region, but has declined in population until now it has only 2466.

**Carstairs** (kar'stârs), or CARSTARES, WILLIAM, a Scottish divine of political eminence, born in 1649 near Glasgow, died in 1715. He studied at the University of Edinburgh, and afterwards at Utrecht. He was introduced to the Prince of Orange, on whom he made a favorable impression. In 1672 he came to London, and two years after he was arrested on account of his connection with the exiles in Holland, and was kept five years a prisoner in Edinburgh Castle. He was released in 1679, and afterwards played a part of some importance in the schemes of those who were working in favor of William of Orange. Though he did not approve of it, he became privy to the Rye-house plot, in consequence of which he was apprehended and subjected to the torture, which he endured with great firmness. Being released, he returned to Holland, and was received by the Prince of Orange as a sufferer in his cause. His scholarship, sagacity, and political information won for him the confidence of William, who planned the invasion of 1688 mainly by his advice. When William was settled on the throne Carstairs was constantly consulted by him on Scotch affairs. He was the chief agent between the Church of Scotland and the court, and was very instrumental in the establishment of Presbyterianism, to which William was averse. On the death of William he was no longer employed on public business, but Anne retained him as her chaplain royal, and made him principal of the University of Edinburgh. When the union of the two kingdoms was agitated he took a decided part in its favor. He was repeatedly moderator of the general assembly of the church. His countrymen have mostly looked upon him as an enlightened patriot.

**Cart,** a carriage with two wheels, with or without springs, fitted to be drawn by one horse, and used for carrying goods or as a vehicle for conveying persons.

**Cartagena** (kâr-tâ-hā'nâ), or CARTHAGENA (kâr-thā-jē'na), a fortified town and seaport of Spain, in the province of and 31 miles S. S. E. Murcia: with a harbor which is one of the largest and safest in the Mediterranean, sheltered by lofty hills. The town is surrounded by a wall; the principal streets are spacious and regular. When Spain was in a more flourishing condition Cartagena carried on a more extensive commerce than now, having also a greater population. It is still a naval and military station, with an arsenal, dockyards, etc. Lead smelting is largely carried on; and there are in the neighborhood rich mines of excellent iron. Esparto grass, lead, iron ore, oranges, etc., are exported. Formerly very unhealthy, it has been greatly improved by draining. Cartagena was founded by the Carthaginians under Hasdrubal about 243 B.C., and was called New Carthage. It was taken by Scipio Africanus B.C. 210, and was long an important Roman

town. It was ruined by the Goths, and revived in the time of Philip II. Pop. 103,373.

**Cartagena** (kâr-tâ-jē'nâ), or CARTHAGENA (kâr-tha-jē'na), a city and seaport, Republic of Colombia, on the Caribbean Sea, capital of the state of Bolivar, well laid out, with well-paved streets and a naval arsenal. The exports are coffee, cotton, ivory-nuts, rubber, hides, etc. The trade, which had partly gone to Sabanilla and Santa Marta, is being again recovered since the reopening of the canal to the Magdalena. Pop. 14,000.

**Cartago** (kar-tâ'gō), a town of Central America, in Costa Rica. It formerly had a pop. of about 37,000, but was utterly ruined by an earthquake in connection with an eruption of a neighboring volcano in 1841, so that its

population has decreased to from 8000 to 10,000.

**Cartago,** a town in Colombia, in the valley of the Cauca, in a well-cultivated district and with a good trade. Pop. 9000.

**Carte** (kart), THOMAS, an English historian, born in Warwickshire in 1686; died in 1754. He studied at Oxford and Cambridge, took the degree of M. A. at the latter, and entered the church. Having incurred the suspicion of having been concerned in plots against the government, he fled to France and remained abroad for some years, returning in 1728. In 1736 he published *Life of James, Duke of Ormonde* (2 vols. folio), and in 1747–52 three vols. of his voluminous *History of England*, a fourth being published in 1755. His work is distinguished by careful and elaborate research, and has supplied Hume and other historians with much material.

**Carte-blanche** (kȧrt-blȧnsh; literally *white* or *blank paper*), a blank paper duly signed, entrusted to a person to fill up as he pleases, and thus giving unlimited power to decide.

**Carte-de-visite** (kȧrt-dė-vi-zēt'), literally a visiting card, a name applied to a size of photographs somewhat larger than a visiting card, and usually inserted in a photographic album. Cartes-de-visite were introduced by Disdéri in 1854.

**Cartel** (kar'tel), an agreement for the delivery of prisoners or deserters; also, a written challenge to a duel.—*Cartel-ship*, a ship commissioned in time of war to exchange prisoners.

**Carter** (kar'ter), ELIZABETH, an English lady of great learning, the daughter of Dr. Nicholas Carter, a clergyman in Kent, was born in 1717; died in 1806. She was educated by her father, and learned Latin, Greek, French, and German, to which she afterwards added Italian, Spanish, Portuguese, Hebrew, and Arabic. She wrote poems, contributed two papers to the *Rambler;* translated the critique of Crousaz on Pope's *Essay on Man;* Algarotti's explanation of *Newton's Philosophy* for ladies; and *Epictetus;* and was a friend of Johnson, Reynolds, Burke, and other eminent men of the time.

**Cartesian Diver** (kar-tē'si-an), a hydrostatic toy consisting of a little hollow glass figure, which has a small opening some distance below the top, and is rather lighter than an equal column of water, so as to be able to float. The figure is placed in a bottle or cylindrical vessel of water, closed with a piece of bladder or India rubber so as to exclude air. On pressing this with the finger the air inside the figure is compressed, it sinks down, and from the introduction of a small quantity of water becomes specifically heavier. By removing the pressure the water is expelled, and the figure, thus lightened, again rises to the surface.

**Cartesian Philosophy.** See *Descartes.*

**Cartesian Vortices.** See *Descartes.*

**Carthage** (kar'thaj; L. *Carthago*, Gr. *Karchēdōn*), the most famous city of Africa in antiquity, capital of a rich and powerful commercial republic, situated in the territory now belonging to Tunis. Carthage was the latest of the Phœnician colonies in this district, and is supposed to have been founded by settlers from Tyre and from the neighboring Utica about the middle of the 9th century before Christ. The story of Dido and the foundation of Carthage is mere legend or invention. The history of Carthage falls naturally into three epochs. The first, from the foundation to 410 B.C., comprises the rise and culmination of Carthaginian power; the second, from 410 to 265 B.C. is the period of the wars with the Sicilian Greeks; the third, from 265 to 146 B.C., the period of the wars with Rome, ending with the fall of Carthage.

The rise of Carthage may be attributed to the superiority of its site for commercial purposes and the enterprise of its inhabitants, which soon acquired for it an ascendency over the earlier Tyrian colonies in the district, Utica, Tunis, Hippo, Septis, and Hadrumetum. Its relations with the native populations, Libyans and nomads, were those of a superior with inferior races. Some of them were directly subject to Carthage, others contributed large sums as tribute, and Libyans formed the main body of infantry as nomads of cavalry in the Carthaginian army. Besides these there were native Carthaginian colonies, small centers and supports for its great commercial system, sprinkled along the whole northern coast of Africa, from Cyrenaica on the east to the Straits of Gibraltar on the west.

In extending its commerce Carthage was naturally led to the conquest of the various islands which from their position might serve as entrepôts for traffic with the northern shores of the Mediterranean. Sardinia was the first conquest of the Carthaginians, and its capital, Caralis, now Cagliari, was founded by them.

Soon afterwards they occupied Corsica, the Balearic, and many smaller islands in the Mediterranean. When the Persians under Xerxes invaded Greece the Carthaginians, who had already several settlements in the west of Sicily, co-operated by organizing a great expedition of 300-000 men against the Greek cities in Sicily. But the defeat of the Carthaginians at Himera by the Greeks under Gelon of Syracuse effectually checked their further progress (480 B.C.). The war with the Greeks in Sicily was not renewed till 410. Hannibal, the son of Gisco, invaded Sicily, reduced first Selinus and Himera, and then Agrigentum. Syracuse itself was only saved a little later by a pestilence which enfeebled the army of Himilco (396). The struggle between the Greeks and the Carthaginians continued at intervals with varying success, its most remarkable events being the military successes of the Corinthian Timoleon (345–340) at Syracuse, and the invasion of the Carthaginian territory in Africa by Agathocles, B.C. 310. After the death of Agathocles the Greeks called in Pyrrhus, King of Epirus, to their aid, but notwithstanding numerous defeats (B.C. 277–5), the Carthaginians seemed, after the departure of Pyrrhus, to have the conquest of all Sicily at length within their power. The intervention of the Romans was now invoked, and with their invasion, B.C. 264, the third period of Carthaginian history begins. The First Punic War (L. *Punicus*, Phœnician), in which Rome and Carthage contended for the dominion of Sicily, was prolonged for twenty-three years, B.C. 264 to 241, and ended, through the exhaustion of the resources of Carthage, in her expulsion from the island. The loss of Sicily led to the acquisition of Spain for Carthage, which was almost solely the work of Hamilcar and Hasdrubal. The Second Punic War, arising out of incidents connected with the Carthaginian conquests in Spain, and conducted on the side of the Carthaginians by the genius of Hannibal, and distinguished by his great march on Rome and the victories of Lake Trasimene, Trebia, and Cannæ, lasted seventeen years, B.C. 218 to 201, and after just missing the overthrow of Rome, ended in the complete humiliation of Carthage. (See *Rome*, *Hannibal.*) The policy of Rome in encouraging the African enemies of Carthage occasioned the Third Punic War, in which Rome was the aggressor. This war, begun B.C. 150, ended B.C. 146, in the total destruction of Carthage.

The constitution of Carthage, like her history, remains in many points obscure. The name of king occurs in the Greek accounts of it, but the monarchical constitution, as commonly understood, never appears to have existed in Carthage. The officers called kings by the Greeks were two in number, the heads of an oligarchical republic, and were otherwise called Suffetes, the original name being considered identical with the Hebrew *Shofetim*, judges. These officers were chosen from the principal families, and were elected annually. There was a senate of 300, and a smaller body of thirty chosen from the senate, sometimes another smaller council of ten. In its later ages the state was divided by bitter factions, and liable to violent popular tumults. After the destruction of Carthage the territory became the Roman 'Province of Africa.' Twenty-four years after its fall an unsuccessful attempt was made to rebuild Carthage by Caius Gracchus. This was finally accomplished by Augustus, and Roman Carthage became one of the most important cities of the empire. It was taken and destroyed by the Arabs in 638. The religion of the Carthaginians was that of their Phœnician ancestors. They worshiped Moloch or Baal, to whom they offered human sacrifices; Melkart, the patron deity of Tyre; Astarte, the Phœnician Venus, and other deities, which were mostly propitiated by cruel or lascivious rites.

**Carthage,** the capital of Jasper Co., Missouri, the center of the rich lead regions in the southwest of the state, 60 miles w. of Springfield. It has manufactures of furniture, bedsprings, ironware, etc. Pop. 9483.

**Carthagena.** See *Cartagena.*

**Carthamine** (kar'tha-min), or Carthameine; a dye obtained by a chemical process from *Carthamus tinctorius* or safflower. The crystals yielded dissolve readily in alcohol, forming a purple-red solution, which when fresh attaches itself permanently to cotton or silk (not to wool), no mordant being needed. It dyes the fabric a fine red. This becomes yellow on the addition of alkalies, but may be made red again by the use of acids.

**Carthamus** (kar'tha-mus). See *Safflower.*

**Carthusians** (kar-thū'si-ans), a religious order instituted by St. Bruno (see *Bruno*), who, about 1084, built several hermitages 4 leagues from Grenoble in S. E. France, and, with six companions, united the ascetic with the monastic life. They practised the

greatest abstinence, wore coarse garments, and ate only vegetables and the coarsest bread. From their original seat (*La Chartreuse*) they were called *Carthusians*.

Carthusian Monk.

Their fifth general, Guigo (died 1137), prescribed, besides the usual monastic vows, eternal silence and solitude. In the following centuries they received additional statutes, which forbade altogether the eating of flesh, and allowed them to speak only during certain hours on Thursdays and the days on which the chapter met. With increasing wealth some modifications were introduced in their silent and solitary life. Their habit is a hair-cloth shirt, a white tunic, a black cloak, and a cowl. The Carthusians were introduced into England about 1180, and built the Charter-house (a name corrupted from *Chartreuse*) in 1371. Their chief convent is still La Grande Chartreuse. See *Chartreuse*.

**Cartier** (kär-tyā), Sir George Étienne, a Canadian statesman, born at St. Antoine, Quebec, in 1814; died in England in 1873. He was admitted to the bar in 1835, took part in the rebellion of 1837, and had for a time to leave Canada. In 1848 he entered the Canadian parliament, and in 1855 became provincial secretary. Next year he became attorney-general for Lower Canada, in which post he was active in behalf of legal reforms. In 1857 he was a member of the Macdonald ministry, and in 1858 he himself became premier, remaining in this position till 1862. He was active in bringing about the establishment of the Dominion of Canada in 1867, and held a post in the first Dominion cabinet. The following year he received a baronetcy.

**Cartier** (kär-tyā), Jacques, a French navigator, born at St. Malo in 1494, time of death not known. He commanded an expedition to North America in 1534, entered the Straits of Belle Isle, and took possession of the mainland of Canada in name of Francis I. Next year he sailed up the St. Lawrence as far as the present Montreal. He subsequently went to found a settlement in Canada, and built a fort near the site of Quebec. He was ennobled by the king for his discoveries.

**Cartilage** (kär'ti-lāj), or Gristle, a firm and very elastic substance occurring in vertebrate animals. When cut, the surface is uniform, and contains no visible cells, cavities, nor pores, but resembles the section of a piece of glue. It enters into the composition of parts whose functions require the combination of firmness with pliancy and flexibility, the preservation of a certain external form with the power of yielding to external force or pressure. The ends of bones entering into the formation of a joint are always coated with cartilage. *Temporary cartilages* are those from which bones are formed by ossification. The *permanent cartilages* are of various kinds. They are found in the external ear and aid in forming the nose, the larynx, etc.

**Cartilaginous Fishes** (-laj'i-nus), a general designation for those fishes whose skeleton consists of cartilage instead of bone, and which comprise the sharks and skates or rays. See *Chondropterygii*.

**Cartoon** (kar-tōn'), in painting, a drawing on stout paper or other material, intended to be used as a model for a large picture in fresco, a process in which it is necessary to complete the picture portion by portion and in which a fault cannot afterwards be easily corrected. The cartoon is made exactly the size of the picture intended, and the design is transferred to the surface to be ornamented by tracing or other processes. Cartoons executed in color, like paintings, are used for designs in tapestries, mosaics, etc. The most famous are those painted by Raphael for the Vatican tapestries, seven of which are still preserved in the South Kensington Museum, London. The subjects of the seven are: 1, Paul Preaching at Athens; 2, The Death of Ananias; 3, Elymas the Sorcerer Struck with Blindness; 4, Christ's Charge to Peter; 5, The Sacrifice at Lystra; 6, Peter and John Healing the Cripple at the Beautiful Gate of the Temple; 7, The Miraculous Draught of Fishes. In recent times the term is also applied to a pictorial sketch of humorous or satirical nature relating to some notable character or events of the day.

**Cartouche** (kär'tösh). (1) In architecture, a sculptured ornament in the form of a scroll unrolled, often appearing on the cornices of columns, used as a field for inscriptions, etc.—(2) In heraldry, a sort of oval shield, much used by the popes and

secular princes in Italy, and others, both clergy and laity, for painting or engraving their arms on.—(3) The name given to that oval ring or border which includes, in the Egyptian hieroglyphics, the names of persons of high distinction. The annexed cut shows a cartouche of one of

Cartouche.

the Ptolemies, kings of Egypt. with the inscription, 'Ptolemy eternal beloved of Phtah.'

**Cartridge** (kär'trij), a case of paper, parchment, or flannel suited to the bore of firearms, and holding the exact charge, including, in the case of small arms, both powder and bullet (or shot). In loading with the old style of cartridge for muzzle-loading rifles, the paper over the powder was bitten or twisted off and the powder poured in, the bullet being then inserted and rammed home. The cartridges used for breech-loading rifles contain the powder in a case of solid brass, and have the percussion-cap by which they are ignited fixed in the base. Such cases can be refilled and used a number of times in succession. Cartridges for shot-guns are similar to those for rifles, but are usually of less solid construction, being commonly of strong paper with a base of metal. Those for large guns are usually made of flannel and contain only the powder. Blank cartridge is a cartridge without ball or shot. Cartridges for blasting are filled with dynamite or other explosive.

**Cartridge-paper,** a thick variety of paper originally manufactured for soldiers' cartridges, but extensively used in the arts—its rough surface giving it an advantage for drawing upon—and for other purposes.

**Cartwright** (kärt'rīt), EDMUND, the inventor of the power-loom, was born in 1743 in Nottinghamshire. He was educated at Oxford, and took orders in the church. In 1785, he brought his first power-loom into action. Although much opposed both by manufacturers and workmen, it made its way, and in a developed and improved form is now in universal use. Cartwright spent much of his means in similar inventions, and fell into straitened circumstances, from which a parliamentary grant of £10,000 relieved him. He died in 1823.

**Cartwright,** THOMAS, one of the eminent Puritan divines of the 16th century, born in Hertfordshire in 1535; died in 1603. He suffered imprisonment and exile more than once for his nonconformist opinions. He was a learned man, and at one time professor of divinity at Cambridge.

**Carucate** (kȧ r'ö-kā t), formerly as much land as one team could plow in the year. The size varied according to the nature of the soil and practice of husbandry.

**Carum.** See *Caraway.*

**Caruncle** (kar-ung'kl), a fleshy excrescence on the head of a fowl, as the comb of a cock, the wattles of a turkey.

**Carupano** (ka-rö'pa-nō), a seaport of Venezuela, on the Peninsula of Paria. Has a good roadstead and considerable trade. Pop. 12,389.

**Carus** (kä'rus), KARL GUSTAV, German physician and physiologist, born at Leipzig in 1789; died at Dresden in 1869. He became professor of midwifery at the Medical Academy, royal physician, and then privy-councilor. He published a number of writings, covering medicine, physiology, anatomy, psychology, physics, and painting.

**Carus,** PAUL, editor and author, born at Ilsenburg, Germany, 1852; was graduated at the University of Tübingen, 1876, removed to the United States and founded the Monist and the Open Court at Chicago. His books include *Fundamental Problems, The Religion of Science, The Gospel of Buddha, Whence and Whither,* etc.

**Caruso** (kä-rö'sō) ENRICO, a noted Italian opera singer, born at Naples in 1874. He made his début in a small theater near his native city in 1896, and from there his reputation spread until he was known throughout musical circles as the finest tenor singer of the day. He first came to America in 1903.

**Carvel-built** (kär'vel-bilt), a term applied to a ship or boat the planks of which are all flush and not overlapping, as in clincher-built boats.

**Carvin** (kär-vaṇ), or CARVIN ÉPINAY, a manufacturing town of France, dep. of Pas de Calais. Pop. commune, 9391.

**Carving** (kärv'ing), as a branch of art, is the process of cutting a hard body by means of a sharp instrument into some particular shape, and is a term generally employed in speaking of figures cut out in ivory or wood, in contradistinction to sculpture, or figures produced in stone or metal. The art of

carving is of the highest antiquity. Even among the most uncivilized tribes, rudely-carved representations in wood are common. In the early and middle ages wood-carving became general for the decoration of Christian churches and altars. One of the latest developments of the art of carving is the modern invention of carving by machinery. A machine patented in 1845 by Mr. Jordan is capable of copying any carved design that can be produced, so far as that is possible, by revolving tools; the finish is afterwards given by hand-labor. The term is also applied to the skillful cutting up of meats or fowls at table.

**Cary** (kā'ri), ALICE, author, born near Cincinnati, Ohio, in 1820; died in 1876. Her poems and sketches are graceful and full of charming pictures of home life, her *Clovernook Papers* containing some of her happiest efforts. Her sister Phoebe (1824-71) also wrote attractive verse, and contributed a third to the *Poems of Alice and Phoebe Cary* (1850).

**Cary,** HENRY FRANCIS, the translator of Dante, was born in 1772, and educated at Oxford. In 1797 he received the vicarage of Abbot's Bromley, Staffordshire. In 1805 appeared his translation of Dante in English blank-verse. He subsequently translated the *Birds* of Aristophanes and the *Odes* of Pindar. In 1826 he was appointed assistant librarian in the British Museum, and retired in 1837 on a pension of £200 a year. He died in London in 1844.

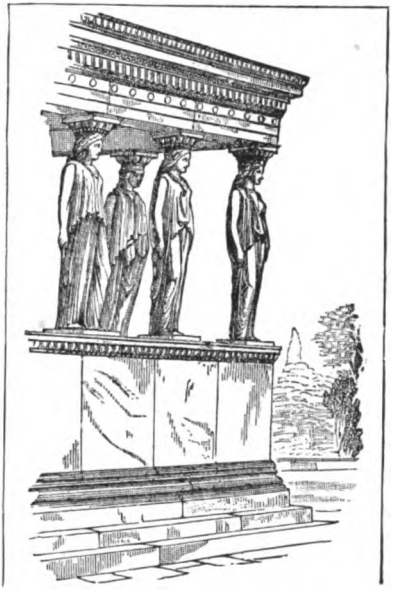
**Cary,** LUCIUS. See *Falkland.*

**Carya,** the hickory genus of plants.

**Caryatides** (kar-i-at'i-dez), or CAR'YATIDS, in architecture, figures of women dressed in long robes, serving to support entablatures. Vitruvius relates that the city Caryæ sided with the Persians after the battle of Thermopylæ, and that it was on that account sacked by the other Greeks, who took their wives captive, and to perpetuate this event erected trophies in which figures of women dressed in the Caryatic manner were used to support entablatures. This story is, however, believed to be unworthy of credit, although it seems to be not improbable that the idea and name of the Caryatides were derived from this city. Corresponding male figures are called *Atlantes* (which see).

**Caryocar** (kar'i-ō-kär), a genus of plants, nat. order Rhizobolaceæ, consisting of lofty trees, natives of tropical America, which produce good timber, and also *souari* or butternuts.

**Caryophyllaceæ** (kar-i-ō-fil-ā'ce-ē), an order of plants, of which the pink, named formerly *Caryophyllus*, and now *Dianthus*, may be considered as the type. The plants have opposite undivided leaves, without stipules, tumid articulations of the stems, and seeds disposed upon a free central placenta, surrounded by several carpellary leaves. The great proportion of the species are inconspicuous weeds, like chickweed, sandwort, etc., but many are found as favorite plants in our gardens, as the carnation, sweet-william, etc.



Caryatides.

**Caryopsis** (kar-i-op'sis), in botany, a small, one-seeded, dry, indehiscent fruit in which the seed adheres to the thin pericarp throughout, as in wheat and other grains.

**Caryota** (kar-i-ō'ta), a genus of palms, with doubly-pinnate leaves, the best-known species of which (*C. urens*) is a native of most of tropical Asia; it supplies an inferior kind of sago, and from its juice is made toddy or palm-wine.

**Casale** (kä-sä'lā), a city of Northern Italy, province of Alessandria, on the Po, 18 miles N.N.W. of Alessandria. Its citadel, founded in 1590, was one of the strongest in Italy, but is now dilapidated It has a cathedral, consecrated in

1107. Silk is the chief industry. Pop. 18,874.

**Casalpusterlengo** (ka-s ä l'pös-t e r-lān'gō), a town of Northern Italy, in the province of Milan; commerce in Parmesan cheese. Pop. 5513.

**Casamicciola** (k å-s å-mich'o-lå), a village on the Italian island of Ischia, frequented for sea-bathing and the use of its warm springs, but recently destroyed by earthquakes.

**Casanova** (kås-å-nō'vå) GIOVANNI JACOPO, DE SEINGALT, born at Venice, 1725, known by his *Memoirs* as an adventurer who acted a prominent part in all situations, among all classes of society, and in all the large cities of Europe, by turns acting the part of diplomatist, preacher, abbot, lawyer, and charlatan. Among others with whom he came in contact were Rousseau, Voltaire, Suvaroff, Frederick the Great, and Catherine II. He died in Bohemia in 1798. His celebrated *Memoirs* are a lively picture of the manners of his times, but probably not very veracious.

**Casareep.** See *Cassareep.*

**Casas,** BARTOLOMEO DE LAS. See *Las Casas.*

**Casaubon** (ka-sau'bon), ISAAC DE, classical scholar, born Feb. 18, 1559, at Geneva, was educated by his father, a clergyman. In his ninth year he spoke Latin fluently. In 1582 he became professor of the Greek language at Geneva. Henry IV invited him to Paris and made him royal librarian. After the death of Henry IV he followed Sir Henry Wotton, envoy extraordinary from James I. to England, where he was received with distinction, had two benefices and a pension conferred on him, and died at London, July 1, 1614. He was buried in Westminster Abbey. Casaubon was a liberal theologian, a man of extensive learning, a good translator, and an excellent critic of the ancient classics, many of which he has edited. He wrote also an excellent treatise on Greek and Roman satire.—His son, MERIC, born at Geneva 1599, likewise distinguished himself by his learning, publishing commentaries on Terence, Marcus Aurelius, etc. He died in England in 1671.

**Casbin,** or KAZ'VIN. See *Kazvin.*

**Cascade** (kas-kād') RANGE, a range of mountains in North America, near the Pacific coast, to which they are parallel, extending from the Sierra Nevada in California northwards to Alaska. It contains several active volcanoes. Highest peaks, Mount St. Elias, 19,500 feet; McKinley, 20,464 feet. The highest peaks in the southern portion of it are in the State of Washington, where Mount Tacoma or Mount Ranier reaches 14,444 feet.

**Cascarilla** (kas-ka-ril'a), the aromatic bitter bark of *Croton Eleutheria*, a small tree of the nat. order Euphorbiaceæ. (See *Croton.*) The name has recently been applied also to a subdivision of the genus *Cinchona* (which see).

**Casco Bay** (kas'kō), a bay of Maine, between Cape Elizabeth on W. S. W. and Cape Small Point on E. N. E. Within these capes are more than 300 small islands, most of them very productive.

**Case** (kās), in grammar, a modification or inflection of a noun, pronoun, or adjective, by which a different shade of meaning is communicated to the word. In nouns and pronouns case supplies the place of prepositions, indicating the relation of the word thus modified to other words in the phrase or sentence, as John (nominative) speaks; John's (possessive) dog barks. There is only one case in English for nouns, the possessive or genitive (John's). English pronouns have three cases—nominative, genitive, and accusative, as *he, his, him.* In Sanskrit there are eight cases. In French, Italian, Spanish, and Portuguese the nouns have no case-inflections. In German there are four cases, nominative, genitive, dative, accusative.

**Case,** in letterpress printing. See *Printing.*

**Case,** in law, a cause or action, or a statement on which a decision is to be given.

**Case-hardening,** is a process by which iron is superficially converted into steel, in such articles as require the toughness of the former conjointly with the hardness of the latter substance. The articles intended for case-hardening are first manufactured in iron, and are then placed in an iron box, with charcoal in powder, and heated to redness. Immersion into water then converts the surface into a coating of steel.

**Casein** (kā'sē-in; from L. *caseus*, cheese), that ingredient in milk which is neither coagulated spontaneously, like fibrin, nor by heat, like albumen, but by the action of acids alone, and constituting the chief part of the nitrogenized matter contained in it. Cheese made from skimmed milk and well pressed is fully half casein. Casein is one of the most important elements of animal food as found in milk and legu-

minous plants. It consists of carbon 53.7 per cent, hydrogen 7.15, nitrogen 16.65, oxygen 22.65, and sulphur 0.85.

**Casemates** (kās'māts; from the Spanish *casa*, a house, and *matare*, to kill), in fortification, vaults which are proof against bombs, and which may serve as a place for keeping ordnance, ammunition, etc., and in case of necessity as habitations for the garrison.

**Casement,** SIR ROGER, knight, Irish revolutionist, hanged in London for high treason August 3, 1916. He was born in 1864, and was in the British consular service from 1895 to 1913, serving in the Congo, Rio de Janiero, and elsewhere. When the Great war broke out he went to Germany to enlist German aid in freeing Ireland from British control. He was captured in April, 1916, on his arrival at Tralee, Ireland, from a German submarine, his intention being to aid the Sinn Fein revolt.

**Caserta** (kä-ser'tä), or CASERTA NUOVA, the capital of the province of Caserta, South Italy, in a plain, 7 miles E. S. E. of Capua and 18 from Naples. Pop. 19,180.—The province has an area of 2307 square miles and a population of 783,000.

**Cash Credit,** CASH ACCOUNT, a mode of advancing funds originated by the Scotch banks, and since adopted by others. A cash credit is an account which the trader may overdraw to a certain amount as he may require, paying cash in and taking it out according to his needs within that limit. Heritable property, two sureties, or some other form of security is usually demanded by the bank.

**Cashel** (kash'el), a town of Ireland, County Tipperary, 88 miles S. W. of Dublin; with a spacious cathedral, a handsome episcopal palace, now the deanery-house, barracks, etc., and several interesting ruins. Cashel was the seat of the ancient kings of Munster. Pop. 2938.

**Cashew** (ka-shö'; *Anacardium occidentāle*), a tree of the order Anacardiaceæ, common in the West Indies. Its fruit is called the cashew-nut. The nut is small, kidney-shaped, ash-gray, and contains an acrid juice, but its noxious property is destroyed by roasting, after which it is esteemed a great delicacy. It is used to flavor Madeira wine, and is eaten cooked in various ways. The fumes it gives off when roasting are so acrid as sometimes to cause inflammation. The stalk or receptacle of the nut is large and fleshy and has an agreeable acid flavor.

Anacardium Occidentale. 1,1,1, Cashew-nuts.

**Cashgar** (kash-gar'). See *Kashgar*.

**Cashmere,** or KASH'MIR (kash'mēr), an extensive principality in the N. W. of Hindustan, subject to a ruler (the maharajah) belonging to the Sikh race. The principality embraces not only Cashmere proper, but also Jamoo or Jummoo, Baltistan or Little Tibet, Ladakh, Gilghit, etc. The area is estimated at 80,000 square miles. It extends from about 32° to 37° N. lat., and from about 73° to 80° E. lon., and is largely a region of mountains, containing magnificent glaciers. The Kuenlun range bounds it on the north, one peak of which rises to the height of 28,265 feet. The country is watered by the Upper Indus and its tributaries, and by the Jhelum and Chenab. Cashmere proper, which forms a small portion of the whole, is a valley surrounded by gigantic mountains, the Himalaya and Hindu Kush, and traversed by the river Jhelum (formerly Hydaspes). There are ten chief passes through the mountains into this valley, varying in height from about 9000 to 12,000 feet. The elevated situation of the valley, and the mountains of snow which surround it, render the climate rather cold; but the region is well watered by streams and very fertile. Forests on the slopes, fields of corn, rice crops along the sides of the rivers, rich orchards, and an abundant growth of flowers distinguish the district, but the fruits of warm climates do not ripen here. Among its minerals are iron and plumbago. Sulphur springs are common. Earthquakes frequently occur, and in 1885 one caused the loss of thousands of lives. Bears, leopards, wolves, the ibex, and chamois are among the animals. The flora has a strong affinity to that of Europe; the deodar cedar forms extensive and valuable forests. The common European fruits are grown, and attention is now being paid to the culture of the vine. The chief crops are wheat, barley, rice, and Indian corn, and two harvests are reaped in the year. The chief manufacture is that of the celebrated Cashmere shawls, but it is not so extensive as it once was, since manufactories have been established at Amritsar in the Punjab, and elsewhere. The genuine Cashmere

shawls owe their superiority to the material of which they are made, which is, properly speaking, not wool, but a fine kind of down with which the animals of this region are clad during the winter season, and which in length and fineness far surpasses the merino wool. This down is obtained in great quantities from the Cashmere goat, the yak of Tibet, and the wild sheep. It is spun by women and girls, and then passes into the hands of the dyers. From the dyers the yarns are passed to the weaver, and the shawl is woven in stripes, which are afterwards very skillfully sewed together. The average time taken to manufacture a good Cashmere shawl is from sixteen to twenty weeks. The inhabitants of Cashmere are a fine race physically, tall, strong, and well built, with regular features. There are thirteen separate dialects in use. The Maharajah is independent, but his relations with other states are subject to the authority of the government of India. The capital of the whole principality is Jamoo. Srinagar (or Cashmere) is the Maharajah's summer residence and largest town. The government revenue is paid in kind, and the grain claimed by the state is stored in public granaries and sold at fixed prices. Population 1901, 2,905,578.

**Cashmere Goat,** a variety of the common goat remarkable for its fine downy fleece, said to be found in perfection only in Tibet in the neighborhood of Lhassa, but also found in other parts of this region, including Ladakh, now a province of Cashmere. The colder the region where the goat pastures, the heavier is its fleece. A full-grown goat yields not more than 8 ounces, the fine curled wool being close to the skin. A large shawl of the finest quality requires 5 lbs. of the wool; one of the inferior quality from 3 to 4 lbs.

**Cashmere Shawl.** See *Cashmere* and *Cashmere Goat.*

**Cash Register,** a form of calculating machine made for use in retail stores, its functions being to make a record of money received from sales. It records all money put in the cash drawer, and adds this automatically to the sums previously put in the drawer, so that at night the day's receipts may be at once seen. The record of each sale is also visible to the customer if he desires to see it. This is the simplest form. There are more complex ones which make further records, such as credit sales, or the sales made by each salesman, or for special kinds of goods, etc.

**Casimir** (kas'i-mir) III, THE GREAT, King of Poland, born in 1309, ascended the throne in 1333, conquered Little Russia, Silesia, and repelled the Tatars. He protected the peasants with much energy, and out of favor for one of his mistresses who was a Jewess, conferred valuable privileges on the Jews. After his death the crown of Poland was recognized as elective. Died 1370.

**Casimir-Perier,** JEAN PIERRE SAUL, born at Paris in 1847; died in 1907. His military services during the siege of Paris brought him in 1871 the title of Chevalier of the Legion of Honor. In 1874 he entered the French legislature, where he gained such distinction that he was vice-president of that body 1885–93, and president in 1893. For six months (1893–94), he held the post of premier of France, and on the assassination of M. Carnot, June 1894, he was made President of the French republic. He held the office only a few months, resigning in January, 1895.

**Casino** (kȧ-sē'nō; Italian, a summer house), a name generally given to a kind of clubhouse or place of amusement, containing rooms for dancing, playing at billiards, etc.

**Casoria** (kȧ-sō'rē-a), a town of Italy, 6 miles N. N. E. of Naples. Pop. 9306.

**Caspe** (käs'pā), a town of Spain, province of Saragossa, 12 miles N. N. E. of Alcañiz, near the Ebro. Pop. 7735.

**Caspian Sea** (kas'pi-an), a large lake or inland sea between Europe and Asia, 730 miles in length from N. to S., and from 115 to 280 in breadth; area, 170,000 sq. miles; the largest isolated sheet of water on the globe. Its surface is 85 feet below that of the Sea of Azof and below sea-level; greatest depth 3190 feet. Russian territory surrounds it on three sides, Persia on the fourth. It abounds in shallows, making navigation difficult. Among the rivers which flow into it are the Volga, Ural, Terek, and Kur. It has no outlet. The water is less salt than that of the ocean, of a bitter taste, and of an ochre color, without ebb or flow. The fisheries are valuable, including those of sturgeon, sterlet, roach, bream, perch, carp, seal, and porpoise. The only ports at all worthy the name on or near the Caspian are Astrakhan, Derbend, Baku, Krasnovodsk, and Astrabad. Steam-packets are now established on it. The Russians have also a fleet of warships in the Caspian. By the Volga and canals there

is water communication with the Baltic, and a canal has been proposed along the Manytch to the Sea of Azof.

**Casque.** See *Helmet.*

**Cass,** LEWIS, statesman, born in Exeter, New Hampshire, in 1782; died in 1866. In 1813, having entered the army, he rose to the rank of general; in 1814–30 he was Governor of Michigan, was Secretary of War in 1831, Minister to France, 1840–1842. U. S. Senator, 1844–57, was a candidate for the presidency several times, and in 1857–60 was Secretary of State. He resigned in 1860 in consequence of the failure of President Buchanan to reinforce Fort Sumter. He wrote *France: its King, Court and Government*, and the *History, Traditions, Languages, etc., of Indians in the United States.*

**Cassagnac** (kâs-ân-yâk), ADOLPHE BERNARD GRANIER DE, a French journalist and politician, born 1806, died 1880. He began his career at Paris as contributor of literary criticisms to the *Journal des Débats*, and soon made himself known, and latterly notorious, as editor of various papers, the *Globe*, the *Pouvoir*, the *Pays*, etc., and as being involved in many controversies and duels. He published various books, chiefly historical. Amongst the principal are: *Portraits Littéraires, Histoire des Causes de la Révolution Française, Histoire des Girondins, L'Empereur et la Democratie moderne.*—His son, PAUL DE CASSAGNAC, born 1842, had a career and a reputation not dissimilar to those of his father. Like his father, he was a devoted Bonapartist. Died 1904.

**Cassander** (kas-san'dêr), a king of Macedonia, born about 354 B.C. He displaced his brother Polysperchon in the regency, and removed in succession the mother, the wife, and the son of Alexander the Great to make way for himself to the throne. He married Thessalonica, Alexander's half-sister, and founded the city of that name in her honor. In company with Seleucus, Ptolemy, and Lysimachus he defeated and slew Antigonus, king of Asia, whose dominions were divided amongst the conquerors. He died in 297 B.C.

**Cassandra** (kas-san'drâ), in Greek legend, a daughter of Priam and Hecuba. She is fabled to have been endowed by Apollo with the gift of prophecy, coupled with this disadvantage, that her prophecies should never be believed. She frequently foretold the fall of Troy, and warned her countrymen in vain against the stratagem of the horse. When Troy was taken she fell, as part of his share of the booty, to Agamemnon, who, in spite of her warnings, carried her with him as his slave to Mycenæ, where they were both murdered by Clytemnestra.

**Cassano** (ka-sän'ō), two towns in Italy.—1. A town, province of and 32 miles N. N. E. of Cosenza, the seat of a bishopric. Has hot sulphurous springs. Pop. 6842.—2. CASSANO D'ADDA, a town 16 miles N. N. E. of Milan, where Prince Eugene was defeated in 1705 by the Duke de Vendôme, and the French, under Moreau, by Suwarow in 1799. Pop. 3892.

**Cassareep,** CASSIREEP (kas'a-rēp, i-rēp), the concentrated juice of the roots of the common or bitter cassava (*Manihot utilissima;* see *Cassava*), flavored by aromatics and deprived of its poisonous properties by boiling. It is used to give a relish to soups and other dishes, and forms the basis of the West Indian "pepper-pot." It is a powerful antiseptic, and is very useful in keeping meat fresh in a tropical climate.

**Cassation** (kas-sā'shun), a term used in the courts on the continent of Europe, signifying the annulling of any act or decision, if the forms prescribed by law have been neglected, or if anything is contained in it contrary to law.—*Court of Cassation*, one of the most important institutions of modern France, established by the first national assembly in 1790. In 1814 the number of its members was fixed at forty-nine, at which it still remains. The members are appointed for life. The sphere of this court is to decide on the competency of the other courts, and on the petitions to have their decisions reviewed or annulled. Its decisions are not only recorded in the journals of the courts the decisions of which are reversed, but published likewise in an official bulletin. It has enjoyed from its commencement the respect and confidence of France.

**Cassava** (ka-sâ'va; *Manihot utilissima*), a South American shrub, about 8 feet in height, with broad, shining, and somewhat hand-shaped leaves, and beautiful white and rose-colored flowers, belonging to the natural order Euphorbiaceæ, sub-order Crotoneæ. A nutritious starch is obtained from the white soft root of the plant, and is called by the same name. It is prepared in the West Indies, tropical America, and in Africa in the following manner:—The roots are washed, stripped of their rind, and grated down to a pulp, which is put into coarse, strong canvas bags, and sub-

mitted to powerful pressure to express the juice, which is highly poisonous in its natural state. The flour that remains after pressing is formed into cakes, and baked on a hot iron plate. In this state it forms a valuable article of food, upon which many of the inhabitants of Southern America live almost entirely. From cassava the tapioca of commerce is prepared. Another species (*M. Aipi*), the sweet cassava, has roots the juice of which is not poisonous, and which are an agreeable and nutritive food. The cassava is also called *Manioc* or *Mandioc*.

Cassava Plant (*Manihot utilissima*).

**Cassel,** or KASSEL. (kăs'sel), formerly the residence of the Elector of Hesse-Cassel, is now the chief town in the province of Hessen-Nassau, Prussia, on the Fulda, 91 miles N. N. E. of Frankfort-on-the-Main. The Old and New Town are connected by a bridge over the Fulda. There are several fine squares, in the principal of which, the Friedrichsplatz, the largest in any town in Germany, stands the palace of the ex-elector, an indifferent structure. There is a museum and library (200,000 vols.), and a valuable picture-gallery. The city has manufactures of machinery, mathematical instruments, gold and silver wares, chemicals, knives, gloves, leather, porcelain, etc. There are many fine walks and public gardens in the vicinity; amongst the latter are the gardens of Wilhelmshöhe, in which is situated the ex-elector's summer palace, the residence of the late Emperor Napoleon III, after his being taken prisoner at Sedan, from Sept. 5, 1870, to March 19, 1871. Pop. 153,078.

**Cassel** (ancient *Castellum Menapiorum*), a town, France, dep. Nord, on an isolated hill in the center of a large and fertile plain, dating from the time of Julius Cæsar. Pop. (1906) 1844.

**Cassia** (kash'ya), a large genus of leguminous plants, inhabiting the tropical parts of the world. The species consist of trees, shrubs, or herbs; the leaves are abruptly pinnated, and usually bear glands on their stalks. The leaflets of several species constitute the well-known drug called senna. That imported from Alexandria is obtained from *C. acutifolia* and *C. obovāta*. East Indian senna consists of the lance-shaped leaflets of *C. elongāta;* and other species supply smaller quantities in commerce. *C. fistŭla* is found wild in India, and has been introduced into other tropical countries. Its legumes contain a quantity of thick pulp, which is a mild laxative, and enters into the composition of the confection of cassia and the confection of senna. The leaves and flowers are also purgative. The bark and roots of several of the Indian species are much used in medicine. *Cassia bark* is a common name for the bark of an entirely different plant, *Cinnamōmum cassia*, belonging to the laurel family. It is much imported into Europe, mostly from China, and is also called *Cassia lignĕa*. Its flavor somewhat resembles that of cinnamon, and as it is cheaper it is often substituted for it, but more particularly for the preparation of what is called oil of cinnamon. The cassia of the Bible was probably cassia bark. *Cassia buds*, which are similar in flavor, are obtained from allied trees.

**Cassicus** (kas'si-kus), an American genus of insessorial birds the Cassicans, family Icteridæ (American orioles), allied to the starlings, remarkable for the ingenuity with which they weave their nests. *C. cristātus*, sometimes called the crested oriole, a S. American bird, constructs a pouch-shaped nest of the length of 30 inches.

**Cassin** (kas'in), JOHN, ornithologist, born in Delaware Co., Pennsylvania in 1813; died in 1869. He was an active member of the Academy of Natural Sciences of Philadelphia and published *Illustrations of the Birds of California, Texas, Oregon, British and Russian America, American Ornithology*, and *Mammology and Ornithology of the United States Exploring Expedition under Lieutenant Wilkes*.

**Cassini** (kăs-sē'nē), a name famous in astronomy and physics for three generations:—(1) GIOVANNI DOMENICO, born in 1625 near Nice, became professor of astronomy at the University of Bologna, but afterwards settled in France. He discovered four of the satellites of Saturn and the zodiacal light, proved that the axis of the moon is not perpendicular to the plane of the ecliptic, and showed the causes of her libration. He died in 1712.—(2) JACQUES, his son, born at Paris in 1677. After several essays on subjects in natural philosophy, etc., he completed his great work on Saturn's satellites and ring. His labors to determine the figure of the earth are well known. He died in 1756.—(3) CASSINI DE THURY, CÉSAR FRANÇOIS, son of the preceding, born

in 1714, member of the Academy from his twenty-second year, undertook a geometrical survey of the whole of France, which was completed by his son. He died in 1784.—(4) CASSINI, JEAN DOMINIQUE, COUNT DE THURY, son of the preceding, born at Paris 1748, was a statesman of ability as well as a mathematician. In 1787 he completed the topographical work which was begun by his father, and which in its complete state consists of 180 sheets. He died in 1845.

**Cassino** (kas-sē'nō), a game at cards somewhat resembling whist.

**Cassiodorus** (kas-si-o-dō'rus) or CASSIODORIUS, MAGNUS AURELIUS, a Roman writer, born in the latter half of the fifth century A.D. He became chief minister of the Ostrogoth King Theodoric, and wrote a collection of letters, *Variarum Epistolarum Libri XII*, which contain most valuable information with regard to the Ostrogothic rule in Italy. He wrote also a *History of the Goths*.

**Cassiopeia** (-pē'ya), a conspicuous constellation in the northern hemisphere, situated next to Cepheus, and often called the *Lady in Her Chair*. It contains fifty-five stars, five of which, arranged in the form of a W, are of the third magnitude.

**Cassiquiari** (kä-sik-i-ä'rē), or CASSIQUIARE, a large river of South America, in Venezuela, which branches off from the Orinoco and joins the Rio Negro, a tributary of the Amazon. By means of this river water communication is established for canoes over an immense tract of South America, it being practicable to sail from the interior of Brazil to the mouth of the Orinoco.

**Cassiterides** (kas-si-tėr'i-dēz), a name derived from the Greek *kassiteros*, tin, and anciently applied to the tin district of Cornwall, or the Scilly Isles, though some identify the Cassiterides with small islands on the N. W. coast of Spain.

**Cassiterite** (kas-sit'er-It; see preceding art.), an ore of tin widely distributed, and the one from which most of the metal is obtained. It is a peroxide, and consists of tin 79, oxygen 21.

**Cassius** (kash'e-us), full name CAIUS CASSIUS LONGINUS, a distinguished Roman, one of the assassins of Julius Cæsar. In the civil war that broke out between Pompey and Cæsar he espoused the cause of the former, and, as commander of his naval forces, rendered him important services. After the battle of Pharsalia he was apparently reconciled with Cæsar, but later was among the more active of the conspirators who assassinated him B.C. 44. He then, together with Brutus, raised an army, but they were met by Octavianus and Antony at Philippi. The wing which Cassius commanded being defeated, he imagined that all was lost, and killed himself, B.C. 42. See *Brutus* and *Cæsar*.

**Cassius, PURPLE OF** (named from its discoverer, a German physician), a purple pigment used in porcelain and glass painting, prepared from the muriate of gold by adding to it a mixture of the protochloride and perchloride of tin.

**Cassivellaunus** (kas-si-ve-lą'nus), a British chief who, when Cæsar invaded Britain, held sway over the tribes living to the N. of the Thames, and who, on account of his valor, was appointed leader of the British forces which opposed Cæsar. He had at first some slight success, but Cæsar ultimately forced a passage across the Thames and put the enemy to flight. In the end Cassivellaunus sued for peace, which was granted on condition that he should pay a yearly tribute and give hostages.

**Cassock** (kas'ok), a tight-fitting coat worn under the gown or surplice by the clergy. The cassock is generally black; but in the Church of Rome only the ordinary priests wear black cassocks, those of bishops being purple, of cardinals scarlet, and that of the pope white.

**Cassowary** (kas'ō-wa-ri), a family of birds akin to the ostrich, emeu, etc., among living, and to the moa and others among extinct, birds. The shortness of their wings totally unfits them for flying, and, like others of their order, the pectoral or wing muscles are comparatively slight and weak, while those of their posterior limbs are very robust and powerful. The cassowaries are divided into two genera—*Casuarius*, or cassowary proper, and *Dromæus*, the emeu. The former has a long, compressed bill, a crest on the head, and stiff, featherless quills on the wings; the latter has a broader and shorter bill, feathers on the head, and no rudiment of the wing visible externally. They have three toes. Several species of both genera are known, and of these the most familiar is the helmeted cassowary (*C. galeātus*), so called from its head being surmounted by an osseous prominence, covered with a sort of horny helmet. The cassowary feeds on fruits,

eggs of birds, etc., and bolts its food with great voracity. It is a native of the island of Ceram. The skin of the head and superior part of the neck is naked, of a deep-blue and fiery-red tint, with pendent wattles similar to those of the turkey-cock. It is about 5½ feet long. Of the other nine species of the genus, one inhabits Australia and five New Guinea, the rest the adjacent islands. The Australian species is very similar to that of Ceram, and indeed they all resemble each other. They inhabit thick forests and scrub, and run with great rapidity. In self-defense they can kick with great force. See also *Emeu*.

**Cast,** in the fine arts, is an impression taken by means of wax or plaster of Paris from a statue, bust, bas-relief, or any other model, animate or inanimate. When plaster casts are to be exposed to the weather their durability is greatly increased by saturating them with linseed-oil, with which wax or rosin may be combined.

**Castalia** (kas-tā'li-a), a celebrated fountain in Greece sacred to Apollo and the Muses, and fabled to have the power of inspiring those who drank its waters. It issues from a fissure between two peaked cliffs adjoining Mount Parnassus.

**Castanea.** See *Chestnut*.

**Castanets** (kas'ta-nets), an instrument composed of two small concave shells of ivory or hardwood, shaped like spoons, placed together, fastened to the thumb, and beat with the middle finger. This instrument is used by the Spaniards and Moors as an accompaniment to their dances and guitars.

Castanets.

**Caste** (kast), a term applied to a distinct class or section of a people marked off from others by certain restrictions, and whose burdens or privileges are hereditary. The word is derived from the Portuguese *casta*, a breed or race, and was originally applied to the classes in India whose occupations, customs, privileges, and duties are hereditary. It is probable that wherever caste exists it was originally grounded on a difference of descent and mode of living, and that the separate castes were originally separate races. It now prevails principally in India, but it is known to exist or have existed in many other regions. Some maintain that it was prevalent in ancient Egypt, but this seems uncertain. All Hindus are divided into four castes: the Brahmans or sacerdotal class, the Kshatriyas or military class, the Vaisyas or mercantile class, and the Sudras or servile class. But this fourfold division is rather a theory than according to the facts, the Hindus being actually divided into a great number of special castes, distinguished by their trades, etc. (See *Brahmanism*.) 'The effect of the caste system is,' as the *Cyclopædia of India* says, 'that no man may lawfully eat with any individual of any other caste, or partake of food cooked by him, or marry into another caste family; but he may be his friend, his master, his servant, his partner.' Those that are outside of any caste are known as *pariahs*.

**Castelar** (kâs-tā-lar'), Emilio, a Spanish politician and author, born in 1833; died in 1899. In 1856 he was made professor of history in the University of Madrid, but becoming involved in the republican disturbances of 1866, he had to take refuge in Switzerland. Having gone back to Spain in 1868, he was returned to the Cortes in the following year. In 1873 he was elected president of the republican Cortes, but resigned in Jan., 1874, in consequence of the vote of confidence being defeated. After the pronunciamiento in favor of Alphonso XII, Dec. 13, 1874, Castelar retired from Spain, but in a year or two returned, and became a member of the Cores. He published many poems and political works.

**Castel-Franco** (kâs-tel-frâ'nko), a fortified town in North Italy, in the province and 15 miles w. of Treviso; the birthplace of the painter Giorgione. Pop. 3187.

**Castellamare** (kâs-tel'-a-mâ-rā)—1. A seaport town of Italy, on the Gulf of Naples. It is fortified, and has a royal dockyard, manufactories of linen, silk, etc. Pop. 26,378.—2. A seaport on the north coast of Sicily, 20 miles E. of Trapani. Wine, fruit, grain, oil, etc., are exported. Pop. 19,957.

**Castellan** (kas'tel-an), or Chatelain, properly the owner or commander of a castle. In Flanders and France the title went with the possession of certain districts, and in Normandy and Burgundy châtelains ranked next after bailiffs, with both civil and military authority. In Germany the châtelains were imperial officers with

military and civil jurisdiction in fortified places.

**Castellana** (kȧs-te-lȧ'nȧ), a town of S. Italy, prov. Bari. Pop. 11,957.

**Castellaneta** (kas-t e l-l a-n ā't ȧ), a c a t h e d r a l town of Southern Italy, 18 miles N. W. of Tarentum. Cotton is extensively grown in the vicinity. Pop. 10,196.

**Castelleone** (kas-tel-lā-ō'nā), a town of North Italy, 12 miles N. W. of Cremona. Pop. 4000.

**Castellon-de-la-Plana** (kȧs-t e l-y o n'), a town of Spain, capital of the province of Castellon, 40 miles N. N. E. of Valencia, in a large and fertile plain, with manufactures of sailcloth, woolen and hempen fabrics, ropes, paper, soap, etc., and some trade in hemp, grain, and fruit. Pop. of town, 29,904; of province, 310,828; area of latter, 2445 sq. miles.

**Castelnaudary** (kȧs-tel-nō-da-rē), a town of Southern France, dep. Aude, 22 miles W. N. W. of Carassonne, with manufactures of cloth, linen, and earthenware, distilleries and tanneries, and a good trade. Pop. 6650.

**Castel-Vetrano** (vā-trȧ'nō), a town of Sicily, province of Trapani, on a rocky hill; industries: silk, linen, cotton, etc. The white wine produced in the neighborhood is esteemed the best in Sicily. Pop. 21,446.

**Casti** (kas'tē), GIAMBATISTA, a poet, born in 1721 at Prato, in the vicinity of Florence. His writings are of a lively and graceful but almost always licentious character. The *Novelle Galanti*, a series of tales: the *Animali Parlanti*, an epic poem; and his comic operas are amongst his chief works. He died at Paris in 1803.

**Castiglione** (kȧs-tēl-yō'nā), a small town of North Italy, 17 miles S. E. of Brescia, where the French obtained a decisive victory over the Austrians in 1796, which gave to Marshal Augereau his title of Duc de Castiglione. In the vicinity is Solferino. Pop. about 3500. There are several smaller towns and villages of the same name in Italy and a larger one in Sicily, prov. Catania; famous for its filberts; pop. 12,255.

**Castiglione** (kȧs-tēl-yō'nā), BALDASSARE, one of the most elegant of the older Italian writers; born in 1487; died in 1529. Among his works the *Libro del Cortegiano* ('Book of the Courtier') is the most celebrated. His letters are valuable contributions to political and literary history.

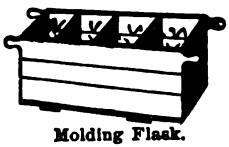


**Castile** (kas-tēl'), an ancient kingdom of Spain, the nucleus of the Spanish monarchy, extends over a large part of the peninsula from the Bay of Biscay southward. It is divided into NEW CASTILE and OLD CASTILE. The former (*Castilla la Nueva*) occupies nearly the center of the peninsula; area 28,010 square miles. It is traversed from E. to W. by three lofty mountain chains, nearly parallel to each other—the Sierra Guadarrama, the mountains of Toledo and Sierra Molina, and the Sierra Morena. Between these chains, which form the great watersheds of the province, lie two extensive plains or plateaux, almost without wood, and arid and barren in appearance. Dryness, indeed, is the curse of the whole country, and there is a great deficiency of method alike in agriculture and industries. The inhabitants, are of a grave, manly character, with much of the old Spanish pride and probity, but devoid of enterprise, and content to live on from day to day as their fathers did before them. This ancient province now forms the five provinces of Madrid, Ciudad-Real, Cuenca, Guadalajara, and Toledo. Pop. 1,853,314.—OLD CASTILE (*Castilla la Vieja*) stretches from the Bay of Biscay to NEW CASTILE; area, 25,405 sq. miles. It is traversed by three mountain chains—the Sierra de Guadarrama, the Sierra de Deza, and the Cantabrian Mountains. It is less dry than New Castile, and grain, particularly wheat, is raised in great abundance. The pastures both of the mountains and the plains are excellent, and much merino wool is produced. Old Castile now forms the provinces of Burgos, Logroño, Santander, Soria, Segovia, Avila, Palencia, and Valladolid. Pop. 1,761,440. See *Spain*.

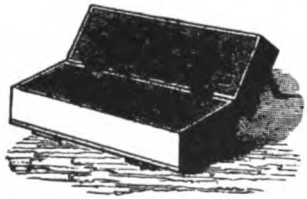
**Castillejo** (kȧs-til-yā'hō), CRISTOVAL DE, a Spanish poet, born in 1494; died in 1556. His works possess great originality, and his language is pure and manly, yet sparkling with wit and satire. He was the last representative of the old Spanish court poetry, and strenuously opposed Boscan and Garcilaso in introducing the classical Italian forms of literature.

**Casting** (kast'ing), the running of melted metal into a mold prepared for the purpose, so as to produce an article of a certain shape. Iron-casting (or iron-*founding*) is the most important branch. In general, an exact pattern, usually of wood, is employed by the iron-founder. The floor of every foundry is composed, for several feet deep, of a loamy sand, in which deep pits may be sunk to bury large molds.

The wooden pattern is pressed firmly down into this, the sand being shoveled up all around, level with the top of the pattern, and well rammed down. The pattern is then lifted out of the sand, all small pieces of sand which may have fallen into the mold carefully blown away, and some finely-powdered charcoal sifted over the surface. The molten metal is then poured into the mold until it is full. The whole is then covered with sand to keep the air from it while it cools. An open horizontal bed of sand is sufficient for casting many articles, but with articles of a more complex form and not too large, a frame or box, called a flask, is generally employed to hold together the sand used in casting, the number of flasks varying according to the form and parts of the mold. In ordinary operations the pattern is laid on a board known as the turn-over board, and the flask placed over it, the sand being carefully rammed into the flask till it is full. Another board, known as the bottom-board, is then laid upon it. The flask is then turned over, the first or turn-over board taken off, the one side of the pattern uncovered, a fine facing of sand spread upon the surface to prevent adhesion, after which a second flask, called the *cope*, sometimes made with crossbars to strengthen it and help to hold the sand, is placed upon it and sand carefully rammed in. The cope or second flask is then lifted off, the sand which it contains carrying the impression of the upper side of the pattern; the pattern in the lower part of the flask, or *drag*, is then carefully drawn out, and any injuries which the mold receives during the operation are repaired. Holes or passages are then cut into the sand for pouring in the metal, all loose sand is carefully removed, the cope replaced and secured to the drag by clamps. The mold is now ready for the molten metal. In pouring, the metal is generally run through two or three different passages at the same time to prevent it losing fluidity by cooling. It is only in lighter castings that sand, of the proper degree of dryness, porosity, and adhesiveness is used. In heavy castings the mold is usually made of loam, which is more adhesive, and in complicated articles the making of the mold is often a difficult process. Small articles of simple form and of easily-fusible alloys, such as bullets, printing types, etc., are often cast in metal molds. Articles of sculpture are usually cast in plaster of Paris, which, when mixed with water, runs into the finest lines of a mold and takes a most exact impression. The variety of articles made by casting is very great: boilers, cisterns, cylinders, pumps, railings, grates, cannon, cooking-utensils, and many objects of decorative art.



Molding Flask.



Drag and Cope opened.

**Casting-vote,** the vote of a presiding officer in an assembly or council which decides a question when the votes of the assembly or house are equally divided between the affirmative and negative.

**Cast-iron,** the name given to the iron obtained from the blast-furnace by running the fused metal into molds prepared for the purpose. The molds are in the form of long, narrow channels, from which the iron, when it has cooled and solidified, is taken in bars called *pigs*, between 3 and 4 feet long and 3 or 4 inches broad. See *Iron*.

**Castle** (kas'l), an edifice serving at once as a residence and as a place of defense, especially such an edifice belonging to feudal times. Castles differed somewhat at different times and in different places, but they had all several features of similarity. The first defense of a castle was usually the moat or ditch, which sometimes comprised several acres; and behind it was the outer wall, generally of great height and thickness, strengthened with towers at regular distances, and pierced with loop-holes through which missiles could be discharged at the assailants. The main entrance through the outer wall was protected by the *barbican*, with its narrow archway, and strong gates and *portcullis*, and inside there were usually an outer and an inner court, and the strong more or less detached building known as the *keep*, which formed the residence of the owner and his family. This was the most strongly constructed of all the buildings, to which the defenders retreated only in the last extremity. The

cut shows the castle of the Sires de Coucy, France, built in the 13th century. In the foreground is the outer bailey or esplanade, fortified, and containing a chapel, stables, and other buildings. The outer entrance to this was formed by

Castle—Château de Coucy.

the barbican. *a* is the fosse, 20 yards broad; *b*, the gateway, approached by two swing-bridges, defended by two guard-rooms, and having a double portcullis within, giving entrance to vaulted guard-rooms with sleeping apartments, etc., above, *c*; *d*, inner bailey or courtyard; *e*, covered buildings for the men defending the walls or curtains; *f*, apartments for the family, entered by the grand staircase, *g*; *h*, great hall, with storerooms and vaults below; *i*, donjon or keep (the chapel is seen behind it), the strongest part of the castle, with walls of immense thickness. At *k* was a postern leading from the donjon and communicating with an outer postern, drawbridge, etc.; *l*, *m*, *n*, *o*, towers or bastions flanking the walks. In English Edwardian castles (so named from Edward III) the solid keep becomes developed into an open quadrangle, defended at the sides and angles by gatehouses and towers, and containing the hall and state apartments ranged along one side of the court. Around this inner court two or three lines of defense are disposed concentrically. Such castles frequently inclose many acres, and present an imposing appearance. The parts of a perfect Edwardian castle are—the *inner bailey* or inner court; the *walls of the enceinte*, single, double, or triple; the *middle* and *outer baileys*, contained between the walls; the *gatehouses* and *posterns*, or small doors in the wall; and the *moat* or *ditch*, which was usually filled with water. The walls were all strengthened by towers, either circular, square, oblong, or multangular, projecting both outwards and inwards. Such towers were capable of being defended independently of the castle. The gatehouses are distinct works covering the entrance; they contain gates, one or two portcullises, and loopholes raking the passage. From the front of these gatehouses the drawbridge was lowered over the moat. The gateways had frequently a barbican attached. This was a passage between high walls, in advance of the main gate, and having an outer gate of entrance, which was defended by towers and the parapet connected with the main gateway. The top of the wall was defended by a battlemented parapet, and frequently pierced by cruciform loopholes.

**Castlebar** (kas'l-bär), a town of Ireland, capital of County Mayo, with some trade in grain and other agricultural produce. Pop. about 3600.

**Castleford** (kas"l-fĕrd), a town of Yorkshire, W. Riding, 10 miles S. E. of Leeds, with large glassworks. Pop. 23,101.

**Castlemaine** (kas'l-mān), a municipal town in Talbot County, Victoria, Australia, 64 miles N. W. of Melbourne, pleasantly situated and well built and laid out. It owes its importance to the gold-mining and agriculture carried on in its neighborhood. Pop. 5704.

**Castlereagh** (kas"l-rā), LORD. See *Londonderry*.

**Castletown** (kas"l-toun), a small town and seaport near the southern extremity of the Isle of Man, long the capital of the island. In the center is Castle Rushen, originally a Danish fortress of the tenth century, later much extended, and now partly used as a prison and public offices. Pop. 2243.

**Castor** (kas'tĕr), CASTO'REUM, a reddish-brown substance, of a strong, penetrating smell, secreted by two glandular sacs connected with the organs of reproduction of the beaver, and used by perfumers.

**Castor and Pollux,** in Greek mythology, twin divinities, sons of Zeus (Jupiter) and Leda, also called Dioscūri (sons of Zeus). Castor was mortal, but Pollux

was immortal. The former was particularly skilled in breaking horses, the latter in boxing and wrestling. They were the patron deities of mariners. In the heavens they appear as one of the twelve constellations of the zodiac, with the name of *Gemini* (the Twins).

**Castor and Pollux** are two minerals which are found together in granite in the island of Elba. Castor is a silicate of aluminium and lithium, pollux is a silicate of aluminium and the rare element cæsium.

**Castoridæ** (kas-tor'i-dē), a family of rodent animals comprising the beaver, etc.

**Castor-oil,** the oil obtained from the seeds of *Ricinus communis*, or *Palma christi*, a native of India, but now distributed over all the warmer regions of the globe. The oil is obtained from the seeds by bruising and pressing. The oil that first comes away, called cold-drawn castor-oil, is reckoned the best; an inferior quality being obtained by heating or steaming the pressed seeds, and again subjecting them to pressure. The oil is afterwards heated to the boiling point, which coagulates and separates the albumen and impurities. Castor-oil is used medicinally as a mild but efficient purgative. It is chiefly imported from India. The plant is often cultivated as an ornamental plant.

Castor-oil Plant (*Ricinus communis*).

**Castrametation** (kas-tra-me-tā'-shun), the art of tracing out and disposing to advantage the several parts of a camp on the ground.

**Castration** (kas-trā'shun), the act of depriving a male animal of the testicles. It is practised on domestic animals (as oxen and horses) with the object of rendering them more submissive and docile, etc. Men who are castrated are known as eunuchs.

**Castrén** (kas-trān'), MATTHIAS ALEXANDER, a philologist and distinguished student of the Finnish languages, was born in 1813 in Finland. Educated at the University of Helsingfors, his attention was turned to the language of his native country. He traveled much among the nations of the Arctic regions, both in Europe and Asia, including the Norwegian and Russian Lapps, and the Samoyeds of Siberia and the coasts of the White Sea. He was appointed in 1851 professor of the Finnish and old Scandinavian languages in the University of Helsingfors, but he died next year. Among his works are a Swedish translation of the great Finnish epic, the *Kalevala;* besides grammars, travels, and other works.

**Castres** (kästr), a town of Southern France, dep. Tarn, 46 miles east of Toulouse, on the Agout, which divides it into two parts. There are tanneries, paper-mills, foundries, etc., and manufactures of woolen goods, linen, glue, etc. Pop. 19,864.

**Castries** (kas-trē'), a town of the West Indies, capital of the British island St. Lucia with a good port in the Bay of Carenagi and extensive commerce. Pop. 7910.

**Castro** (kas'trō), INEZ DE, a lady of noble birth, secretly married to Pedro, son of Alphonso IV, King of Portugal, after the death of his wife Constantia (1345). The old king Alphonso, fearful that this marriage would injure the interests of his grandson Ferdinand (the son of Pedro by his deceased wife), resolved to put Inez to death. Three noblemen, Diego Lopez Pacheco, Pedro Coelho, and Alvarez Gonsalvez, were his counselors in this scheme, and carried it out themselves by stabbing Inez within the convent where she lived (1355). Two years after King Alphonso died, and Pedro, inducing the King of Castile to give up to him two of the murderers, who had taken refuge there (the third, Diego Lopez, managed to escape), put them to death with cruel tortures. The king then made public declaration of the marriage that had taken place between him and the deceased Inez; and had her corpse disinterred and placed on a throne, adorned with the diadem and royal robes, to receive the homage of the nobility. The body was then conveyed to Alcobaça and buried with great honors. The history of the unhappy Inez has furnished many poets of different nations with materials for tragedies,

and her story is one of the finest episodes in the *Lusiad* of Camoens.

**Castro,** the name of several distinguished Spanish and Portuguese persons. (1) ESTEBAN RODRIGO, a renowned Portuguese physician (1560–1637), who went to Italy, was professor of medicine in the University of Pisa for 22 years, and wrote many valuable medical works in Latin. Was styled 'the Phœnix of Medicine.'—(2) ALFONSO, a noted Spanish theologian and pulpit orator (1495–1558), who accompanied Philip II to England when he went to marry Queen Mary. He wrote a Latin work on *Heresies*, which passed through ten editions in 22 years.—(3) GUILLEM, a Spanish dramatist (1569–1631), a friend of Lope de Vega. His drama, *The Spanish Cid*, gave him a European reputation, and was the original of Corneille's tragedy of the same name, who borrowed freely from Castro. He wrote also *Dido and Æneas* and other dramas.—(4) JOAO, a noted Portuguese soldier and mariner (1500–48), who accompanied the expedition which explored the Red Sea in 1540, and wrote an exact description of that sea. He was appointed governor of India in 1545 and gained a great victory over the Moors at Diu, in which he showed remarkable valor. He was given the title of Viceroy of India in 1547.—(5) JOSE MARIA CASTRO, a Costa Rican statesman, born 1818, who became president in 1847 and again in 1866. Under him Costa Rica withdrew from the Central American Confederacy and he received the title of 'Founder of the Republic of Costa Rica.'—(6) CIPRIANO CASTRO, a Venezuelan president, born in 1858, headed an insurrection against President Andrade in 1900, became provisional president in 1901 and was elected for a six years' term in 1904. His administration was marked by rebellions at home and hostile relations abroad, in which Venezuela was more than once threatened by the warships of creditor nations. In December, 1908, he sought Europe, ostensibly for the benefit of his health. His rule had been so arbitrary and the dissatisfaction of the people was so great that he was suspended from the presidency by a decree of the high court and his return to Venezuela forbidden.

**Castro-del-Rio,** a town of Spain, Andalusia, in the province and 16 miles S. E. of Cordova, on the Guadajoz. There are manufactures of linen, woolen, and earthenwares. Pop. 11,689.

**Castrogiovanni** (-jo-vȧn'nē), a town of Sicily, province of Caltanissetta, near the center of the island, on a high tableland more than 4000 feet above the sea-level. The site of ancient Enna, in ancient times it was adorned with the groves and temples of Ceres (Demeter). Sulphur is obtained in the district. Pop. 25,826.

**Castrovillari** (käs-trō-vil'lä-rē), a town of S. Italy, prov. Cosenza. Pop. 9138.

**Cast-steel,** steel made by fusing the materials and running the product into molds. See *Steel.*

**Castuera** (kȧs-tụ-ā'rȧ), a town of Spain, in province of and 67 miles E. by S. of Badajoz. Pop. 6322.

**Casuarina** (ka-sū-a-rē'na), or BOTANY-BAY OAK, the single genus of the natural order of Casuarinaceæ, or cassowary-trees. There are about thirty species, natives chiefly of Australia. They are jointed, leafless trees or shrubs, nearly related to the birches, having their male flowers in whorled catkins and their fruits in indurated cones. Some of them produce timber called *Beefwood* from its color. *C. quadrivalvis* is called the she-oak, *C. equisetifolia* the swamp-oak.

**Casuistry** (kas'ū-is-tri), that part of the old theology and morals which relates to the principles by which difficult cases of conscience (especially where there is a collision of different duties) are to be settled. Hence a casuist is a moralist who endeavors to solve such doubtful question. There have been many celebrated casuists among the Jesuits—for example, Escobar, Sanchez, Busembaum, etc.—famous for their ingenuity and the fine-spun sophistry of their solutions.

**Casus belli** (kā'sus bel'i), the material grounds which justify a declaration of war.

**Cat** (*Felis domesticus*), a well-known domesticated quadruped, order Carnivora, the same name being also given to allied forms of the same order. It is believed that the cat was originally domesticated in Egypt, and the gloved cat (*F. maniculāta*) of Egypt and Nubia has by some been considered the original stock of the domestic cat, though more probably it was the Egyptian cat (*F. caligāta*). It was seldom, if at all, kept by the Greeks and Romans, and till long after the Christian era was rare in many parts of Europe. Some have thought that the domestic breed owed its origin to the wild cat; but there are considerable differences between them, the latter being larger, and having a shorter and thicker tail, which also does

noc taper. The domestic cat belongs to a genus—that which contains the lion and tiger—better armed for the destruction of animal life than any other quadrupeds. The short and powerful jaws, trenchant teeth, cunning disposition, combined with nocturnal habits (for which their eyesight is naturally adapted) and much patience in pursuit give these animals great advantages over their prey. The cat in a degree partakes of all the attributes of its race. Its food in a state of domestication is necessarily very various, but always of flesh or fish if it can be obtained. Instances of its catching the latter are known, though usually the cat is extremely averse to wetting itself. It is a very cleanly animal, avoiding to step in any sort of filth, and preserving its fur in a very neat condition. Its fur is very easily injured by water on account of the want of oil in it, and it can be rendered highly electric by friction. The cat goes with young for sixty-three days, and brings forth usually from three to six at a litter, which remain blind for nine days. It is usually regarded as less intelligent than the dog, but this is by no means certain. It has a singular power of finding its way home when taken to a distance and covered up by the way. Among the various breeds or races of cat may be mentioned the tailless cat of the Isle of Man (and the Crimea); the tortoise-shell, with its color a mixture of black, white, and brownish or fawn color; the large Angora or Persian cat, with its long silky fur; and the blue or Carthusian, with long soft grayish-blue fur.—The wild cat (*Felis catus*) is still found in Scotland and in various other parts of Europe and Western Asia, chiefly in forest regions, making its lair in hollow trees or clefts of rocks. It is a very fierce animal. There are a number of other animals of similar size and habits known as cats, such as the fishing-cat (*F. viverrina*) of Bengal and Eastern Asia, the leopard cat (*F. bengalensis*) of Northern India, and Southeastern Asia, the marbled cat (*F. marmorāta*) of the same region, the rusty-spotted cat (*F. robiginōsa*), a small Indian species, etc. There are three species of the American lynx which are popularly known as cats: *Lynx rufus*, the American wild cat; *L. rufus maculatus*, the Texas wild cat; and *L. fasciatus*, the reed-cat. The ocelot, serval, and margay may also be called cats.

**Catachresis** (kat-a-krē'sis), a figure in rhetoric, when a word is too far wrested from its true signification; as, to speak of tones being made more *palatable* for 'agreeable to the ear.' So in Scripture we read of the *blood* of the grape. Also, in philol. the employment of a word under a false form through misapprehension in regard to its origin; thus *crayfish* or *crawfish* (Fr., *écrevisse*) has its form by *catachresis*.

**Cataclysm** (kat'a-klism), in geol. a physical catastrophe of great extent, supposed to have occurred at different periods, and to have been the efficient cause of various phenomena observed in the surface configuration of localities.

**Catacombs** (kat'a-kōmz; Gr. *kata*, down, and *kumbos*, a hollow or recess), caves or subterranean places for the burial of the dead, the bodies being placed in graves or recesses hollowed out in the sides of the cave. Caves of this kind were common amongst the Phœnicians, Greeks, Persians, and many oriental nations. In Sicily and Asia Minor numerous excavations have been discovered containing sepulchres, and the catacombs near Naples are remarkably extensive. Those of Rome, however, are the most important. The term *catacumbæ* is said to have been originally applied to the district near Rome which contains the chapel of St. Sebastian, in the vaults of which, according to tradition, the body of St. Peter was first deposited; but (besides its general application) it is now applied in a special way to all the extensive subterranean burial places in the neighborhood of Rome, which extend underneath the town itself as well as part of the neighboring country, and are said to contain not less than 6,000,000 tombs. They consist of long, narrow galleries usually about 8 feet high and 5 feet wide, which branch off in all directions, forming a perfect maze of corridors. Different stories of galleries lie one below the other. Vertical shafts run up to the outer air, thus introducing light and air, though in small quantity. The graves or *loculi* lie lengthwise in the galleries. They are closed laterally by a slab, on which there is occasionally a brief inscription or a symbol, such as a dove, an anchor, or a palm-branch, and sometimes both. The earliest that can be dated with any certainty belongs to the year 111 A.D. It is now regarded as certain that in times of persecution the early Christians frequently took refuge in the catacombs, in order to celebrate there in secret the ceremonies of their religion; but it is not less certain that the catacombs served also as ordinary

places of burial to the early Christians, and were, for the most part, excavated by the Christians themselves. In early times rich Christians constructed underground burying-places for themselves and their brethren, which they held as private property under the protection of the law. But in course of time, partly by their coming under the control of the church and partly by accidents of proprietorship, these private burying-grounds were connected with each other, and became the property, not of particular individuals, but of the Christian community. In the 3d century A.D. there were already several such common burying-places belonging to the Christian congregations, and their number went on increasing till the time of Constantine, when the catacombs ceased to be used as burying-places. From the time of Constantine down to the 8th century they were used only as places of devotion and worship. But their use as formal places of worship can only have been occasional, for the limited dimensions even of the largest rooms, and the extreme narrowness of the passages, must have made it impossible for any large number to take efficient part in the services at one time. But though the idea of the catacombs as regular places of worship may be carried too far, there is no doubt, from the episcopal chairs, altars, basins, etc., found within them, and from the subjects of the mosaics and carvings on the walls, that the rites of the church, and particularly the eucharist and the sacrament of baptism, were often celebrated there. They could never have served as dwelling-places for any length of time to the Christians, residence in most of them for more than a short time being very dangerous to the health. During the siege of Rome by the Lombards in the 8th century the catacombs were in part destroyed, and soon became entirely inaccessible, so that they were forgotten, and only the careful and laborious investigations of moderns, amongst whom De Rossi (*Roma Sotterranea*) and Parker (*The Catacombs*) may be mentioned, have thrown anything like a complete light on the origin and history of the catacombs. There are extensive catacombs at Paris, consisting of old quarries from which has been obtained much of the material for the building of the city. In them are accumulated bones removed from cemeteries now built over.

**Catacoustics** (kat'a-kou-stiks), the science of reflected sounds, or that part of acoustics which considers the properties of echoes.

**Catafalco,** CATAFALQUE (kat-a-fal'-kō, kat'a-falk), a temporary and ornamental structure, representing a tomb placed over the coffin of a distinguished person or over a grave.

**Catalan** (kat'a-lan), a native of Catalonia, or Northeastern Spain, or the language of Catalonia, which holds a position similar to the Provençal, having been early cultivated and having a considerable literature. It was established as a literary language by the close of the 13th century, and is still to some extent used as such in its own region.

**Catalan Grand Company,** the name given to a troop of adventurers raised by Roger di Flor about the beginning of the 14th century. They numbered about 8000 men of different nationalities, Catalans, Sicilians, Aragonese, etc., and were led by Roger to the East to aid Emperor Andronicus in his struggle with the Turks. They fought well and did good service, but their habits of plunder and rapine made them as formidable to their friends as their foes. The company was broken up in 1315, some twelve years after its formation.

**Catalani** (kȧ-tȧ-lȧ'nē), ANGELICA, one of the most celebrated of Italian female singers, born in 1779; died in 1849. After filling the chief soprano parts in the best opera-houses of Italy she visited successively Madrid, Paris, and London, enjoying everywhere great professional triumphs. She had a voice of extraordinary volume and power.

**Catalaunian Plain** (kat-a-lą'n'i-an), the wide plain around Châlons-sur-Marne, famous as the field where Aëtius, the Roman general, and Theodoric, King of the West Goths, gained a complete victory over Attila, 451 A.D.

**Catalepsy** (kat-a-lep'si), a spasmodic disease, generally connected with hysteria, in which there is a sudden suspension of the senses and volition, with statue-like fixedness of the body and limbs in the attitude immediately preceding the attack, while the action of the heart and lungs continues, and the pulse and temperature remain natural. It is generally the consequence of some other disease, or of a constitution enfeebled by the gradual operation of unobserved causes, and is also one of the effects of hypnotism.

**Catalonia** (kat-a-lō'ni-a; anc. *Hispania Tarraconensis*), an old province of Spain, bounded N. by France, E. and S.E. by the Mediterra-

nean, S. by Valencia, and W. by Aragon. The country in general is mountainous, but intersected with fertile valleys, while the mountains themselves are covered with valuable woods and fruit-trees, the slopes being cut in terraces and plentifully supplied with water by an artificial system of irrigation. Wheat, wine, oil, flax, hemp, vegetables, and almost every kind of fruit are abundant. There are mines of lead, iron, alum, etc. On the coast is a coral-fishery. Catalonia, though less fertile than most of Spain, stands pre-eminent for the industry of its inhabitants, who speak the Catalan dialect (see *Catalan*). Pop. 1,966,382; area 12,427 sq. miles. It comprises the modern provinces of Tarragona, Gerona, Lerida, and Barcelona.

**Catalpa** (ka-tăl'pa), a genus of plants, order Bignoniaceæ. The species are trees with simple leaves and large, gay, trumpet-shaped flowers, which emit an offensive odor. *C. syringifolia*, a North American species, is well adapted for large shrubberies, and has been introduced into Europe. *C. longissima* contains much tannin in its bark, and is known in the West Indies by the name of French oak.

**Catalysis** (ka-tal'i-sis), or CONTACT ACTION, the peculiar chemical change which occurs when one body decomposes another without being itself changed; thus oxide of cobalt decomposes a solution of bleaching powder into chloride of calcium and oxygen, itself remaining without change, the oxide of cobalt hence being called a *catalyte*.

**Catamaran** (kat-a-ma-ran'), a sort of raft used in the East Indies, Brazil, and elsewhere. Those of the island of Ceylon, like those of Madras and other parts of that coast, are formed of three logs lashed together. Their length is from 20 to 25 feet, and breadth 2½ to 3½ feet. The central log is much the largest, and is pointed at the fore-end. These floats are navigated with great skill by one or two men in a kneeling posture. The natives think nothing of passing through the surf which lashes the beach at Madras when boats of the best construction would be swamped.

**Catamarca** (kät-a-mär'ka), a province of the Argentine Republic, South America; area, 47,500 square miles; mountainous in all directions except the S. Pop. 103,082. The capital is Catamarca, or more fully San Fernando de Catamarca. Pop. 7397.

**Catamenia.** See *Menstruation*.

**Catamount** (kat'a-mount), or CATA-MOUNTAIN, the mountain wild cat, a name often given in the United States to the puma or cougar.

**Catania** (kă-tă'ni-a; anc. *Catăna*), a city on the east coast of Sicily, in the province of Catania, at the foot of Mount Etna. It has been repeatedly visited by tremendous earthquakes, one of the worst of which was in 1693, when 18,000 people were destroyed, and has been partially laid in ruins by lava from eruptions of Mount Etna. But Catania has always revived, and has much more the features of a metropolis than Palermo. Most of the edifices have an air of magnificence unknown in other parts of the island, and the town has a title to rank among the elegant cities of Europe. The cathedral, founded by Count Roger in 1094, is a fine building. The manufacture of silk, linen, and articles in lava, amber, etc., constitutes the chief industry. The ruins of the amphitheater, which was more extensive than the Colosseum at Rome, are still to be seen, as also the remains of the theater, baths, aqueducts, sepulchral chambers, hippodrome, and several temples. The harbor was choked up by the eruption of 1669, so that for larger vessels there is nothing but a roadstead. In spite of this Catania has a considerable trade, and exports wheat, barley, wine, oil, etc. Pop. 157,722.

**Catanzaro** (kä-tan-zä'rō), a cathedral city of South Italy, capital of province of the same name, on a height, 5 miles from the Gulf of Squillace, with manufactures of silk and velvet, and some trade in wheat, wine, oil, etc. Pop. 22,799. Area of prov. 2307 sq. miles; pop. 482,788.

**Cataplasm** (kat'a-plasm). See *Poultice*.

**Catapult** (kat'a-pult), a machine of the ancients for projecting missiles, chiefly arrows. They may be described as a kind of gigantic crossbow. *Balistæ* were engines somewhat similarly constructed, but were chiefly confined to the shooting of stones.

**Cataract** (kat'a-rakt), a disease of the eye, consisting in an opacity of the crystalline lens, or its capsule, or both. It is quite different from amaurosis, which is a disease of the retina. In cataract the lens becomes opaque, and is no longer capable of transmitting the light. Its earliest approach is marked by a loss of the natural color of the pupil, and when developed it causes the pupil to have a milk-white or pearly color. It is most common in old or elderly people, and is quite painless,

Cataract is treated by different surgical operations, all of them consisting in removing the diseased lens from its situation opposite the transparent cornea. In *couching*, the lens is depressed, removed downwards, and kept from rising by the vitreous humor; but this method is now almost entirely given up in favor of removal of the lens by extraction. *Extraction* consists in making an incision in the cornea, and in the capsule of the lens, by which the lens may be brought forward, and through the cut in the cornea, so as to be altogether removed. The third operation is by *absorption*. This consists in wounding the capsule, breaking down the crystalline, and bringing the fragments into the anterior chamber of the eye, where they are exposed to the action of the aqueous humor, and are at length absorbed and disappear. Extraction is now the regular method, and after it is effected a special kind of spectacles are required.

**Cataract,** or WATERFALL, the leap of a stream over a ledge or precipice occurring in its course. Many cataracts are remarkable for their sublimity, the grandest being the Falls of Niagara, on the Niagara River between Lakes Erie and Ontario, in North America, the river having here a fall of about 160 feet and a great width. Amongst other notable falls are those of the river Montmorency, a tributary of the St. Lawrence, which are 242 feet in height; that of the river Potaro, in British Guiana, about 822 feet high and 369 broad; that of the Yosemite River, California, which makes a perpendicular descent of 2100 feet; the Victoria Falls, on the river Zambesi, in South Africa, about 370 feet high and 1860 yards broad; the Grand Falls, Labrador, about 2000 feet, and the Rovanna Falls, Guiana, 2000 feet. The cataract of the Riukanfoss, on the river Maan, in Norway, is about 900 feet high. The fall of the Staubbach at Lauterbrunnen, in Switzerland, is between 800 and 900 feet, but has a very small volume of water; the falls of the Rhine at Schaffhausen, renowned over Europe, are 300 feet broad and nearly 100 feet in height. In Italy the falls of Terni, on the Velino, and those of the Anio, at Tivoli, are artificial but very beautiful. See the separate articles.

**Catarrh** (ka-tär'; from Gr. *katarreō*, I flow down), an increased secretion of mucus from the membranes of the nose, fauces, and bronchi, accompanied with fever and attended with sneezing, cough, thirst, lassitude, and want of appetite. There are numerous species of catarrh, one which is very common, and is called a *cold in the head;* and another, the influenza, or epidemic catarrh. It is seldom fatal in itself, but often undermines the health, leading to fatal diseases.

**Catawba** (ka-tą'ba), a river of the Carolinas, about 250 miles long. Its name has been given to a light wine of rich Muscadine flavor, which has acquired some celebrity in America, the grape from which it is made having been first discovered near its sources. The wine is chiefly made at Cincinnati, and has had the honor of being sung by Longfellow in one of his lyrics.

**Cat'bird** (*Turdus felivox* or *Galeoscoptes Carolinensis*), a well-known species of American thrush, which during the summer is found throughout the Middle and New England States, frequenting thickets and shrubberies. It has a disagreeable note, strikingly similar to the plaint of a kitten in distress, but also a power of imitating the songs of other birds resembling that of the mocking-bird. The plumage is a deep slate color above and lighter below, and it is about 9 inches in length. In habit it is lively, familiar, and unsuspicious. During the winter it inhabits the extreme south of the United States, and is found also in Mexico and Central America. The catbird frequently attacks the common black snake, which, in the absence of the bird, rifles its nest.

**Cat'boat,** a small sailboat, usually not over 30 feet long, and wide of beam in proportion to its length. It has a single sail, a large fore and aft mainsail, the mast being stepped as far forward as possible. It is very quick working and easily handled by one person; draws little water, depending on a centerboard to prevent making leeway.

**Catch** (kach), a short piece of music, frequently of a humorous and bacchanalian character, written generally in three or four parts. It is a sort of short canon, the second voice taking up the theme when the first has completed the first phrase, the third following the second in same manner.

**Catchfly,** a popular name of several plants of the genus *Silēnē* (which see). *Dianœa muscipula* and *Lychnis Viscaria* are also so called.

**Câteau-Cambrésis** (kă-tō-kän-brā-sis), a town of France, dep. Nord, on the right bank of the Selle, famous for the treaty of its name signed here in 1559, by which Henri II of France gave up Calais to

the English, and agreed to a mutual exchange with Spain of all conquered territories. It has various textile manufactures. It is now known as Le Câteau. Pop. 10,341.

**Catechetical Schools** (kat-e-ket'-i-kal), institutions for the education of Christian teachers, of which there were many in the Eastern Church from the 2d to the 5th century. The first and most renowned were those formed at Alexandria (A.D. 160–400) on the model of the famous schools of Grecian learning in that place, Pantænus, Clement, and Origen being their most famous teachers. The schools at Antioch were also in high repute from about 290 till the 5th century. The Arian controversy broke up the Alexandrian, and the Nestorian and Eutychian controversies the Antioch schools. They were succeeded at a later date by the cathedral and monastic schools.

**Catechism** (kat'e-kizm; from Greek *katēcheō*, to sound down, utter, instruct orally), an elementary book containing a summary of principles in any science or art, but particularly in religion, reduced to the form of questions and answers. The first regular catechisms appear to have been compiled in the 8th and 9th centuries, those by Kero of St. Gall and Otfried of Weissenburg being most famous. In the R. Catholic Church each bishop has the right to make a catechism for his diocese. But in modern times R. Catholic catechisms are generally a pretty close copy of the one drawn up by the Council of Trent (published 1566), of which an English translation was issued in London (1687) under the patronage of James II. Among Protestants the catechisms of Luther (1518, 1520, and 1529) acquired great celebrity, and continue to be used in Germany, though not exclusively. Calvin's smaller and larger catechisms (1536–39) never gained the popularity of those of Luther. The catechism of the Church of England in the first book of Edward VI, March 7, 1549, contained merely the baptismal vow, the creed, the ten commandments, and the Lord's prayer, with explanations, the part relative to the sacraments being subjoined at the revision of the liturgy during the reign of James I. The catechism of the Church of Scotland is that agreed upon by the Assembly of Divines at Westminster, with the assistance of commissioners from the Church of Scotland, and approved of by the General Assembly in the year 1648. What is called the *Shorter Catechism* is merely an abridgment of the *Larger*, and is the one in most common use. The best-known catechism among English Protestant Dissenters was that of Dr. Watts; but the use of catechisms is far from usual among them.

**Catechu** (kat'e-shŏ), a name common to several astringent extracts prepared from the wood, bark, and fruits of various plants, especially by decoction and evaporation from the wood of *Acacia Catechu*, as well as from the seeds of the palm *Arēca Catechu*, and from the *Uncaria Gambier*. Catechu is one of the best astringents in the materia medica. It consists chiefly of tannin, and is used in tanning, in calico-printing, etc. It is chiefly obtained from Burmah. Called also *Terra Japonica* and *Cutch*.

**Catechumens** (kat-e-kū'menz; literally, persons receiving instruction), a name originally applied to those converted Jews and heathens in the first ages of the church who were to receive baptism and had a particular place in the church, but were not permitted to share the sacrament. Afterwards it was applied to young Christians who, for the first time, wished to partake of this ordinance, and for this purpose went through a preparatory course of instruction.

**Category** (kat'e-gor-i), or PREDICAMENT, in logic, an assemblage of all the beings contained under any genus or kind ranged in order. The ancients, following Aristotle, held that all beings or objects of thought may be referred to ten categories, viz.: *quantity, quality, relation, action, passion, time, place, situation*, and *habit*. Plato admits only five: *substance, identity, motion*, and *rest;* the Stoics four: *subjects, qualities, independent circumstances, relative circumstances*. Descartes suggested sever divisions: *spirit, matter, quantity, substance, figure, motion*, and *rest*. Others make but two categories, *substance* and *attribute*, or *subject* and *accident;* or three, accident being divided into the *inherent* and *circumstantial*. In the philosophy of Kant the term categories is applied to the primitive conceptions originating in the understanding independently of all experience (hence called pure conceptions), though incapable of being realized in thought except in their application to experience. These he divides into four classes, *quantity, quality, relation*, and *modality*, placing under the first class the conceptions of *unity, plurality*, and *totality;* under the second, *reality, negation*, and *limitation;* under the third *inher-*

*ence* and *subsistence*, *causality* and *dependence*, and *community* (mutual action); and under the fourth, *possibility* and *impossibility*, *existence* and *non-existence*, *necessity* and *contingency*. J. S. Mill applies the term categories to the most general heads under which everything that may be asserted of any subject may be arranged. Of these he makes five, *existence*, *co-existence*, *sequence*, *causation*, and *resemblance*, or, considering causation as a peculiar case of sequence, four.

**Catenary Curve** (k a t' e-n a-r i), that curve which is formed by a cord or chain of uniform density and thickness when allowed to hang freely between two points. It is of interest as bearing on the theory of arches and domes, and as the curve assumed by the chains of a suspension-bridge.

**Caterpillar** (k a t'e r-p i l-a r). See *Butterfly*.

**Cat'fish**, a remarkably voracious fish, the *Anarrhichas lupus*, belonging to the family of gobies, known also as the *Wolf-fish*; also the name common to several North American fish of the genus *Pimelōdus*. *P. catus* (the common catfish) is known also as the *Horned Pout* and *Bullhead*. It is from 7 to 9 inches in length and is esteemed as a food fish. *P. nigricans*, of the Great Lakes and the Mississippi River, is from 2 to 4 feet long, weighs from 6 to 30 pounds, and is excellent eating.

**Cat'gut**, a cord made from the intestines of sheep, and sometimes from those of the horse, ass, and mule, but not from those of cats. The manufacture is chiefly carried on in Italy and France by a tedious process. Catgut for stringed instruments, as violins and harps, is made principally in Milan and Naples, the latter having a high reputation for treble strings.

**Catha** (ka'tha), a genus of plants, nat. order Celastraceæ, mostly natives of Africa. The leaves and twigs of *C. edūlis*, known as *khat* or *cafta*, possess properties akin to those of tea and coffee, and the plant is much cultivated by the Arabs. The use of khat is of greater antiquity than that of coffee.

**Cathari** (kath'a-ri; Greek, *kathāros*, pure, a name akin to 'Puritans,' applied at different times to various sects of Christians. It became a common appellation of several sects which first appeared in the 11th century in Lombardy and afterwards in other countries of Europe, and which were violently persecuted for their alleged Manichean tenets and usages. They had many other local names. Thus, from their relation to the Bulgarian Paulicians they were sometimes termed *Bulgarians*. In Southern France, when they were mostly prosperous, they were confounded with the Albigenses, and were exterminated with them. The Cathari proper were dualists, of a type closely related to the older Gnostics, held a community of goods, abstained from war, marriage, and the killing of animals, and rejected water-baptism. They professed to strive after a higher life than that embodied in the ordinary religious ideals.

**Catharine.** See *Catherine*.

**Cathar'tes.** See *Turkey Buzzard*.

**Cathartics** (ka-thar'tiks), a general name for purgative medicines.

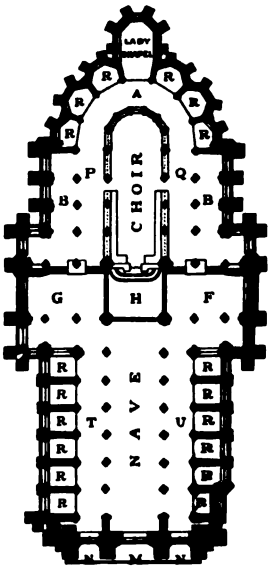
**Cathay** (ka-thā'), an old name of China.

**Cathcart** (kath'kart), SIR GEORGE, son of the following, born in 1794; entered the Life Guards in 1810, accompanied his father as *attaché* to Russia, and subsequently acted as aide-de-camp to the Duke of Wellington at Waterloo. He served in Nova Scotia and the West Indies, quelled the rebellion in Canada in 1837, and was appointed in 1852 governor at the Cape of Good Hope, where he showed ability in subduing the Kaffir insurrection. On the outbreak of the Crimean war great things were expected of him, but he fell as divisional commander at Inkerman in 1854.

**Cathcart,** WILLIAM SHAW, EARL OF, a British general, son of Baron Cathcart of Cathcart, Renfrew, born in 1755; died in 1843. He served in the American revolutionary war and against the French republic in Flanders and Germany, and in 1807 commanded the land forces in the expedition against Copenhagen, being then created viscount. In 1812 he went to Russia as minister plenipotentiary, and in 1814 was created an earl. Subsequently he was for several years ambassador to the Russian court. His son, CHARLES MURRAY, EARL OF CATHCART, born in 1783, served under Wellington in the Peninsula and at Waterloo, was in 1830 created a major-general, and in 1851 commander-in-chief in Canada; died in 1859.

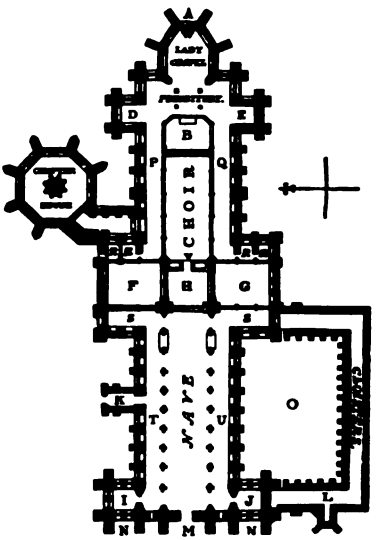
**Cathedral** (ka-thē'dral), the principal church of a diocese, so called from its possessing the episcopal chair or *cathedra*. This is really what distinguishes a cathedral from other churches, though most cathedrals are also larger and more elaborate struc-

tures than ordinary churches, and have various dignitaries and functionaries connected with them. The cathedral establishments in England regularly consist of a dean and chapter, presided over by the bishop, the chapter being composed of a certain number of canons. The dean and chapter meet in the chapter-house of the cathedral; in them the property of the cathedral is vested, and they nominally elect the bishop on a *congé d'élire* also employed. Many cathedrals furnish the most magnificent examples of the architecture of the middle ages; and as they were intended to accommodate great numbers of people, and to exhibit imposing religious services, they are often of great size (St. Peter's, Rome, is 613 feet long and 450 across the transepts). Among the most notable cathedrals are St. Peter's, the largest of all, founded 1450; the cathedral at Milan,




PLAN OF AMIENS CATHEDRAL.

A, Apsidal aisle. B B, Outer aisles of choir.
F G, Transepts. H, Central tower.
I J, Western turrets.
M, Principal or western doorway.
N N, Western side doors.
P Q, North and south aisles of choir.
R R R, Chapels.
T U, North and south aisles of nave.




PLAN OF WELLS CATHEDRAL.

A, Apse or apsis. B, Altar, altar-platform, and altar-steps. D E, Eastern or lesser transept. F G, Western or greater transept. H, Central towers. I J, Western towers. K, North Porch. L, Library or register. M, Principal or western doorway. N N, Western side doors. O, Cloister yard or garth. P Q, North and south aisles of choir. R S, East and west aisles of transept. T U, North and south aisles of nave. R R, Chapels. V, Rood screen or organ loft. W, Altar of Lady chapel.

from the crown. There are often a certain number of honorary canons, also 'minor canons' who assist in the performance of the choral services, choristers, etc. As regards architecture, cathedrals naturally vary much. Those in England are almost all in the Gothic style, cruciform or cross-shaped in arrangement, and having connected with them a chapter-house, side chapels (varying in number and position), cloisters, crypt, etc. This style and arrangement are also common on the continent of Europe, and in most modern cathedrals: but the Romanesque, Renaissance, and Byzantine styles of architecture are

founded in 1386, built of white marble; the cathedral at Florence, begun about 1294, one of the finest specimens of the Italian-Gothic style; Cologne Cathedral, commenced in 1248 (and only finished recently); Nôtre Dame, at Paris, begun 1163; and those of Amiens, Chartres, and Reims. The most noteworthy English cathedrals are St. Paul's, London (1675–1711), in the Renaissance style, and those of Canterbury, Ely, Exeter, Lichfield, Lincoln, Norwich, Salisbury, Wells, Peterboro, Westminster, and York. The cathedrals of Glasgow and Kirkwall are

the only entire cathedrals in Scotland, exclusive of modern edifices. There are a number of cathedrals in the United States, some large and impressive, based on the mediæval architecture.

**Catherine I** (kath'er-in), Empress of Russia and wife of Peter the Great, was a woman of humble origin, who, having become mistress to Prince Menschikoff, was relinquished by him to the czar. In 1708 and 1709 she bore the emperor the Princesses Anna and Elizabeth, the first of whom became the Duchess of Holstein by marriage, and mother of Peter III. The second became Empress of Russia. In 1711 the emperor publicly acknowledged Catherine as his wife, and she was subsequently proclaimed empress, and crowned in Moscow in 1724. When Peter with his army seemed irreparably lost on the Pruth in 1711 Catherine secured the relief of her husband by bribing the Turkish general. At Peter's death in 1725 Catherine was proclaimed Empress and autocrat of all the Russias, and the oath of allegiance to her was taken anew. Catherine died suddenly in 1727, her death having been hastened by dissipation.

**Catherine II,** Empress of Russia, was born in 1729, her father being Christian Augustus, prince of Anhalt-Zerbst. In 1745 she was married to Peter, nephew and successor of the Russian Empress Elizabeth, on

Catherine II of Russia.

whose death in 1762 her husband succeeded as Peter III. In danger of being repudiated in favor of his mistress, the Countess of Woronzoff, Catherine, with the assistance of her lover, Gregory Orloff, and others, won over the guards and was proclaimed monarch (July, 1762). Peter attempted no resistance, abdicated almost immediately, and was strangled in prison a few days later, apparently without Catherine's knowledge. By bribes and threats she readily secured her position, and at once entered upon the administration with great and far-seeing activity. On the death of Augustus III of Poland she caused her old lover, Poniatowski, to be placed on the throne of that country with a view to the extension of her influence there, by which she profited in the successive partitions of Poland in 1772, 1793, and 1795. By the war with the Turks, which occupied a considerable part of her reign, she conquered the Crimea and opened the Black Sea to the Russian navy. Her dream, however, of driving the Turks from Europe and restoring the Byzantine Empire was not to be fulfilled. Her relations with Poland and with other European powers induced her to make peace with Turkey in 1792, and accept the Dniester as the boundary line between the two countries. She appears to have been successful in improving the administration of justice, ameliorated the condition of the serfs, constructed canals, founded the Russian Academy, and in a variety of ways contributed to the enlightenment and prosperity of the country. Her enthusiasm for reform, however, was summarily checked by the events of the French revolution; and the dissipation and extravagance of her court were such that there was even a danger of its exhausting the empire. Of her many lovers, Potemkin was longest in favor, retaining his influence from 1775 till his death in 1791, directing Russian politics throughout that period in all essential matters. She died in 1796.

**Catherine,** St. In the Roman hagiology there are six saints of this name, of whom only two are of importance:—(1) St. Catherine, a virgin of Alexandria who suffered martyrdom in the fourth century. She is represented with a wheel; and the legend of her marriage with Christ has been painted by several of the first masters. (2) St. Catherine of Siena, born in 1347, who was preternaturally pious from her birth, and at six years of age was given to self-castigation and other penances. Urban VI and Gregory XI sought her advice, and in 1460—80 years after her death—she was canonized. Her poems and letters have been published.

**Catherine,** St., Orders of. The Knights of St. Catherine on Mount Sinai are an ancient military

order, instituted for the protection of the pilgrims who came to visit the tomb of St. Catherine on this mountain. In Russia the order of St. Catherine is a distinction for ladies, instituted by Catherine, wife of Peter the Great, in memory of his signal escape from the Turks in 1711.

**Catherine de' Medici** (dă-me-dē-chē), wife of Henry II, King of France, born at Florence in 1519, the only daughter of Lorenzo de' Medici, Duke of Urbino, and the niece of Pope Clement VII. She was married to the Duke of Orleans, afterwards Henry II, in 1533, but had little or no influence at the French court either during the reign of her husband, who was under the influence of his mistress Diana de Poitiers, or during the reign of her eldest son, Francis II, who, in consequence of his marriage with Mary Stuart, was devoted to the party of the Guises. The death of Francis placed the reins of government, during the minority of her son Charles IX, in her hands. Wavering between the Guises on one side, who had put themselves at the head of the Catholics, and Condé and Coligny on the other, who had become very powerful by the aid of the Protestants, she played off one faction against the other in the hope of increasing her own power; and the thirty years of civil war which followed were mainly due to her. Her influence with Charles IX was throughout of the worst kind, and the massacre of St. Bartholomew's Day was largely her work. After the death of Charles IX, in 1574, her third son succeeded as Henry III, and her mischievous influence continued. She died in 1589, shortly before the assassination of Henry III. Of her two daughters, Elizabeth married Philip II of Spain, and Margaret of Valois married Henry of Navarre, afterwards Henry IV.

**Catherine Howard,** Queen of England, fifth wife of Henry VIII, daughter of Lord Edmund Howard, son of the Duke of Norfolk; born 1522. Her beauty and vivacity induced the king to marry her in 1540, but her conduct appears to have been of a dubious kind both before and after marriage, and she was charged in 1541 with adultery. Her paramours Derham and Culpepper were beheaded, and two months later (Feb., 1542) she shared the same fate.

**Catherine of Aragon,** Queen of England, the youngest daughter of Ferdinand of Aragon and Isabella of Castile, was born in 1485. In 1501 she was married to Arthur, Prince of Wales, son of Henry VII. Her husband dying about five months after, the king, unwilling to return her dowry, caused her to be contracted to his remaining son, Henry, and a dispensation was procured from the pope for that purpose. On his accession to the throne as Henry VIII in 1509 she was crowned with him, and despite the inequality of their ages retained her ascendency with the king for nearly twenty years. Her children, however, all died in infancy, excepting Mary, and on the advent of Anne Boleyn, Henry affected to doubt the legality of his union with Catherine. He applied therefore to Rome for a divorce, but the attitude of the papal court ultimately provoked him to throw off his submission to it, and declare himself head of the English church. In 1532 he married Anne Boleyn; upon which Catherine, no longer considered Queen of England, retired to Ampthill in Bedfordshire. Cranmer, now raised to the primacy, pronounced the sentence of divorce, notwithstanding which Catherine still persisted in maintaining her claims, showing from first to last a firm and dignified spirit. She died January 7, 1536.

**Catherine of Braganza,** wife of Charles II, King of England, and daughter of John IV, King of Portugal, was born in 1638. In 1662 she married Charles II, but her husband's infidelities and neglect, and her childlessness, were a source of mortification to her. In 1693 she returned to Portugal, where, in 1704, she was made regent, and in the conduct of affairs during the war with Spain showed marked ability. She died in 1705.

**Catherine Parr,** sixth and last wife of Henry VIII of England, was born in 1512, and had had two husbands before she became Henry's queen in 1543. Her attachment to the reformed religion brought her into some danger, but from this she was released by the king's death in 1547. After the death of the king she espoused the Lord-admiral Lord Thomas Seymour, uncle to Edward VI; but the union was an unhappy one, and she died in childbed in 1548. She was the author of a volume of Prayers or Meditations, and a tract and letters published posthumously.

**Catheter** (kath'e-ter), a term applied in surgery to a tube, made of silver, nickel-plated metal, cotton or linen fabric, India rubber, etc., which

is introduced into the bladder through the urethra, for the purpose of drawing off the urine when it cannot be discharged spontaneously.

**Cathetometer** (kath-e-to'm'e-ter), an instrument for measuring small differences of level between two points; in its simplest form, a vertical graduated rod, upon which slides a horizontal telescope. With the telescope the observer sights the two objects under examination, and the distance on the graduated rod moved over by the telescope is the measure of the distance of height between the two objects.

**Cathode** (kath'ōd). See *Anode;* also *X-Rays.*

**Catholic Apostolic Church.** See *Irvingites.*

**Catholic Church** (kath'o-lik), the universal church, the whole body of true believers in Christ; but the term is often used as equivalent to the Roman or Western Church. See *Roman Catholic Church.*

**Catholic Emancipation,** the abolition of those civil and ecclesiastical restraints to which the R. Catholics of Great Britain, and particularly of Ireland, were once subjected. These restraints, imposed by the statutes of William III, forbade Roman Catholics to hold property in land, and laid their spiritual instructors open to the penalties of felony. These restrictions were not repealed until 1778, and other restraints were not removed until the emancipation act of 1829. This made Catholics eligible to sit in parliament and to hold all offices of state except a few of the highest, including the lord chancellorships of England and Ireland, lord lieutenancy of Ireland and those of regent of the United Kingdom and high commissioner of the Church of Scotland. They are still excluded from the right of presentation to livings, and all places connected with the ecclesiastical courts and establishment. In Ireland the Roman Catholics were treated with still greater injustice, the worst of their disabilities being removed in 1792 and 1793.

**Catholic Majesty,** a title which Pope Alexander VI gave to the kings of Spain, in memory of the complete expulsion of the Moors from Spain in 1491 by Ferdinand of Aragon. But even before that time, and especially after the council at Toledo in 589, several Spanish kings are said to have borne this title.

**Catholicos** (ka-thol'i-kos), the title of the primate of the Armenian Church. His residence is at Etchmiadzin.

**Catiline** (kat'i-lin; LUCIUS SERGIUS CATILINA), a Roman conspirator, of patrician rank, born about 108 B.C. In his youth he attached himself to the party of Sulla, but his physical strength, passionate nature, and unscrupulous daring soon gained him an independent reputation. Despite the charges of having killed his brother-in-law and murdered his wife and son, he was elected prætor in B.C. 68, and governor of Africa in 67. In B.C. 66 he returned to Rome to contest the consulship, but was disqualified by an impeachment for maladministration in his province. Urged on by his necessities as well as his ambition, he entered into a conspiracy with other disaffected nobles. The plot, however, was revealed to Cicero, and measures were at once taken to defeat it. Thwarted by Cicero at every turn, and driven from the senate by the orator's bold denunciations, Catiline fled, and put himself at the head of a large but ill-armed following. The news of the suppression of the conspiracy and execution of the ringleaders at Rome diminished his forces, and he led the rest towards Gaul. Metellus Celer threw himself between the rebels and their goal, while Antonius pressed upon their rear, and, driven to bay, Catiline turned upon the pursuing army and perished fighting (62 B.C.).

**Catinat** (kà-ti-nà), NICHOLAS, Marshal of France, born at Paris 1637. He attracted the notice of Louis XIV at the storming of Lille (1667), and by his conduct, especially at the battle of Senef, gained the friendship of Condé. He was sent as lieutenant-general against the Duke of Savoy, gained the battles of Staffardo (1690), and Marsaglia (1693), occupied Savoy and part of Piedmont, and was made marshal in 1693. In Flanders he displayed the same activity, and took Ath in 1697. In 1701 he received the command of the army of Italy against Prince Eugene; but his ill-furnished forces were defeated at Carpi, and he was disgraced. He died in 1712.

**Cat Island,** one of the Bahama Islands, about 36 miles in length from N. to S., and 3 to 7 in its mean breadth. It was long thought that it, and not Watling Island, was the Guanahani, or San Salvador, where Columbus first touched the New World in 1492.

**Catkin.** See *Amentum.*

**Catlin** (kat'lin), GEORGE, a writer on the American Indians, born in Pennsylvania in 1796; died in 1872. After practising as a lawyer for two years he set up at New York as a portrait-painter, and in 1832 commenced special studies of Indian types, residing many years among them both in N. and S. America. In 1840 he went to Europe, and subsequently introduced three parties of American Indians to European courts. His finely-illustrated works are: *Manners, Customs, and Condition of the North American Indians* (1841); *North American Portfolio* (1844); *Eight Years' Travel in Europe* (1848); *Last Rambles amongst the Indians*, etc. (1868).

**Catmandoo** (kat-man-dö). See *Khatmandu.*

**Catmint** (kat'mint), or CATNIP (*Nepĕta Cataria*), a plant of the natural order Labiatæ, not uncommon in England, scarce in Scotland and Ireland, and widely diffused throughout Europe, N. America, etc. It grows erect to a height of 2 or 3 feet, has whorls of rose-tinged, whitish flowers, and stalked, downy, heart-shaped leaves. It has much the same fascination for cats as valerian root.

**Cato** (kā'tō), DIONYSIUS, the reputed author of the small collection of moral apophthegms known as *Catonis Disticha de Moribus ad Filium.* Nothing is known of him; but the work, which is apparently in large part a genuine classic, had a high reputation in the middle ages.

**Cato,** MARCUS PORCIUS, the Censor, surnamed *Priscus*, also *Sapiens* and *Major* (the Wise and the Elder), a celebrated Roman, born 234 B.C. at Tusculum. He inherited from his father, a plebeian, a small estate in the territory of the Sabines, which he cultivated with his own hands. He served his first campaign, at the age of seventeen, under Fabius Maximus, was present at the siege of Capua in 214 B.C.; and five years after fought under the same commander at the siege of Tarentum. After the war was ended he returned to his farm, but by the advice of Valerius Flaccus removed to Rome, where his forensic abilities had free scope. He rose rapidly, accompanied Scipio to Sicily as quæstor in B.C. 204, became an ædile in 199, and in 198 was chosen prætor, and appointed to the province of Sardinia. Three years later he gained the consulship, and in 194, for his brilliant campaign in Spain, obtained the honor of a triumph. In 191 he served as military tribune against Antiochus, and then, having abundantly proved his soldierly qualities, returned to Rome. For some years he exercised a practical censorship, scrutinizing the characters of candidates for office, and denouncing false claims, peculations, etc. His election to the censorship in 184 set an official seal to his efforts, the unsparing severity of which has made his name proverbial. From that year until his death, in 149, he held no public office, though zealously continuing his unofficial labors for the state. His hostility to Carthage, the destruction of which he advocated in every speech made by him in the forum, was the most striking feature of his closing years. His incessant 'Delenda est Carthago' (Carthage must be destroyed) did much to further the Third Punic War. Of his works, his *De Re Rustica* ('On Rural Economy') alone survives, though there exist in quotation fragments of his history and speeches.

**Cato,** MARCUS PORCIUS (called *Cato of Utica*, the place of his death, to distinguish him from the Censor, his great-grandfather), a distinguished Roman, born 95 B.C. He formed an intimacy with the Stoic Antipater of Tyre, and ever remained true to the principles of the Stoic philosophy. He distinguished himself as a volunteer in the war against Spartacus, served as military tribune in Macedonia in B.C. 67, was made quæstor in B.C. 65. His rigorous reforms won him general respect, and in B.C. 63 he was chosen tribune of the people. During the troubles with Catiline Cato gave Cicero important aid both by his eloquence and sagacity, and at the same time set himself to thwart the ambitious projects of Pompey, Cæsar, and Crassus. Such success as he had, however, was only temporary, and he failed to prevent the formation of the triumvirate. To get rid of him they sent him to take possession of Cyprus, but, having successfully accomplished his mission, he returned, opposed the Tribonian law for conferring extraordinary powers on the triumvirs, and in 54 B.C. enforced, as prætor, an obnoxious law against bribery. On the breach between Pompey and Cæsar he threw in his lot with Pompey, and guarded the stores at Dyrrhachium, while Pompey pushed on to Pharsalia. After receiving news of Pompey's defeat he sailed to Cyrene and effected a junction with Metellus Scipio at Utica, in B.C. 47. He took command of that city, but its defense appearing hopeless after the defeat of Scipio at Thapsus, he determined on suicide, and after spending some time in

reading the *Phædo* of Plato, he stabbed himself in the breast and died, B. C. 46.

**Catoptrics** (ka-top'triks; from Greek *katoptron*, a mirror), that branch of optics which explains the properties of incident and reflected light, and particularly that which is reflected from mirrors or polished surfaces. The whole doctrine of catoptrics rests on the principle that the angle of incidence is equal to the angle of reflection and in the same plane.

**Cats** (kâts), JACOB, born in 1577, one of the fathers of the Dutch language and poetry. He studied at Leyden, Orleans, and Paris, and settled at Middleburg, where he produced his *Emblems of Fancy and Love, Galatea, The Mirror of the Past and Present*, etc. In 1627 and 1631 he was ambassador to England, where he was knighted by Charles I, and from 1636 to 1652 he was grand-pensioner of Holland. He represents the best side of the prosaic Flemish genius of the period, and his many works had a wide popularity.

**Cat's-Eye,** a mineral, a variety of quartz, very hard and semi-transparent, and from certain points exhibiting a yellow, opalescent radiation and somewhat resembling a cat's eye.

**Catskill,** a town, county seat of Greene Co., New York, on the W. bank of the Hudson, 34 miles below Albany, and near the Catskill mountains. It has stone yards, ice houses, and other industries; pop. 5296.

**Catskill, Mountains** (kats'kil), a range of mountains in New York State, principally in Greene county, a portion of the Appalachian system. They lie on the W. side of and nearly parallel with the Hudson, from which their base is, at the nearest point, 8 miles distant. The descent to the valley of the Hudson is exceedingly abrupt, with a cliff escarpment of 1500–3000 feet. The region abounds with attractive scenery and is a highly popular place of resort. The highest peaks are Slide Mt. and Hunter, respectively 4205 feet and 4025 feet.

**Catskill Aqueduct,** one of the greatest engineering enterprises of recent times, only recently constructed, with the purpose of carrying water to New York City at a pressure sufficient to reach the twentieth stories of high buildings. The water is obtained from the Esopus and Schoharie Rivers and Catskill Creek, with a combined watershed of 646 square miles and is collected in the Ashokan Reservoir, 13 miles west of Kingston, N. Y. This reservoir, formed by the building of the Olive Bridge Dam, is approximately 12 miles long by one mile wide, with a maximum depth of 190 feet, and is 590 feet above sea-level. It has a capacity sufficient to supply the city for 335 days at the present rate of consumption, without any water flowing into it. This great work was completed in 1917 at a cost approaching $200,000,000.

**Cat's-tail,** a plant. See *Reed-mace.*

**Cat's-tail-grass.** See *Timothy Grass.*

**Catsup.** See *Ketchup.*

**Catt,** CARRIE, C. L., a Woman Suffrage advocate. Born at Ripon, Wis., she has been twice married, became very active as a lecturer and organizer in the cause of suffrage, and for a number of years has been President of the National Woman's Suffrage Association.

**Cattaro** (kat'a-rō), a fortified seaport of Austria-Hungary, in Dalmatia, at the head of the Gulf of Cattaro, on the E. side of the Adriatic. Pop. 5693.

**Cattegat** (kat'e-gat), a large gulf of the North Sea, between Denmark on the W., Sweden on the E., and the Danish islands of Zealand, Funen, etc., on the S.; about 150 miles from N. to S.; greatest breadth about 90. It is noted for its herring-fishery, but is difficult of navigation. It contains the islands, Samsöe, Anhalt, Lessöe and Hertzhohn.

**Catti** (kat'ti), or CHATTI, one of the most renowned of the ancient German tribes. They inhabited what is now Hesse, also part of Franconia and Westphalia.

**Cattle** (kat' 'l), a term applied collectively to the larger domestic quadrupeds, and often exclusively to those of the ox genus. See *Ox.*

**Cattle-plague.** See *Rinderpest.*

**Catty** (kat'i), in China and the Malayan Archipelago, a weight of 1 1-3 lbs.

**Catullus** (ka-tul'us), CAIUS (or QUINTUS) VALERIUS, a famous Roman lyric poet, born probably B.C. 94, at Verona, or, according to some, at Sirmium, on a peninsula of Lake Benacus; died probably about B.C. 54. He was the friend of Cicero, of Plancus, Cinna, and Cornelius Nepos; to the last he dedicated the collection of his poems. He was the first of the Romans who successfully caught the Greek lyric spirit, and he gave to Roman literature its most genuine songs.

**Cauca** (kou'kä), a South American river in Colombia, an important tributary of the Magdalena; length, 600–

700 miles. It gives its name to a department or state of Colombia; area, 52,000 sq. miles. The valley of the Cauca is one of the richest, most fertile and populous districts of S. America.

**Caucasian Race** (kạ-kā'shan), a term introduced into ethnology by Blumenbach, in whose classification of mankind it was applied to one of the five great races into which all the different nations of the world were divided. Blumenbach believed this to be the original race from which the others were derived, and he gave it the epithet of Caucasian because he believed that its most typical form—which was also that of man in his highest physical perfection—was to be met with among the mountaineers of the Caucasus. In later classifications this 'race' is usually divided into *Aryan* or *Indo-European*, and *Semitic*. Most of the tribes inhabiting the Caucasus belong to the *Turanian* class.

**Caucasus** (kạ'ka-sus), a chain of mountains which gives name to a lieutenancy under the Russian government lying to the southeast of Russia proper, between the Black Sea and the Caspian. The total area of the lieutenancy (including the district of Armenia, acquired in 1878) is 179,527 sq. miles, and the pop. 9,248,695. The Caucasus chain of mountains traverses the lieutenancy from northwest to southeast through a length of 700 miles. It does not form a single chain, but is divided, at least for part of its length, into two, three, or even four chains, which sometimes run parallel with one another, and sometimes meet and form mountain ganglions. The heights of the chief summits are Elbruz, 18,572 feet; Koshtan-tau, 17,123; Dych-tau, 16,928; Kasbek, 16,546. Those mountains, as they lie north of the Caucasian watershed, are to be looked upon as European. The chief rivers are the Terek and Kur, flowing into the Caspian, and the Kuban and Rion (ancient *Phasis*) into the Black Sea. The northern part of the country produces little but grass; but the slopes and valleys on the south, and especially those nearest the Black Sea, produce various kinds of fruits, grain of every description, rice, cotton, hemp, etc. The minerals are valuable. At Baku on the Caspian immense quantities of petroleum are obtained. The inhabitants consist of small tribes of various origin and language—Georgians, Abassians, Lesghians, Ossetes, Circassians, Tartars, Armenians, etc. Some of them are Greek and Armenian Christians, others are Mohammedans, Jews, etc. The Caucasian tribes, especially the Circassians, attracted much attention for over half a century by their stubborn resistance to the arms of Russia. This resistance came to an end in 1859 by the capture of Schamyl, their most distinguished leader.

**Caucus** (kạ'kus), in American politics, a term to denote the gathering of party supporters of a definite line of policy for the purpose of choosing representatives who will carry out such policy, or for the purpose of deciding on some political change. The term is likewise applied to the informal and secret meetings of party leaders. In the legislative bodies of the different states, as well as in Congress, the caucus of all the members of a party is resorted to to secure unity of party action. Professor Skeat refers the origin of the term to an American Indian source.

**Caudebec-les-Elbeuf** (kōd-bek-lā-zel-beuf), a manufacturing town of France, dep. of Seine Inférieure, 12 m. s. of Rouen. Pop. 9681.

**Caudex** (kạ'deks), in botany, the stem of a tree, more especially the scaly trunk of palms and tree-ferns. It often appears as a rhizome running along the surface of the earth or underground.

**Caudine Forks** (kạ'dēn), a pass of S. Italy, in the form of two lofty, fork-shaped defiles, in the Apennines (now called the Valley of Arpaia), into which a Roman army was enticed by the Samnites, B.C. 321, and being hemmed in was forced to surrender.

**Caul** (kạl), a popular name for a membrane investing the viscera, such as the peritoneum or part of it, or the pericardium; also a portion of the amnion or membrane enveloping the fetus, sometimes encompassing the head of a child when born. This caul was supposed to predict great prosperity to the person born with it, and to be an infallible preservative against drowning, as well as to convey the gift of eloquence. During the last century seamen often gave from $50 to $150 for a caul.

**Cauliflower** (kạ'li-flow-ėr), a garden variety of cabbage, in which cultivation has caused the inflorescence to assume when young the form of a compact, fleshy head, which is highly esteemed as a table vegetable. Broccoli is much the same.

**Caulking** (kạk'ing), of a ship, signifies driving a quantity of oakum into the seams of the planks in the ship's decks or sides in order to prevent the entrance of water. After the oakum is driven very hard into these

seams it is covered with hot, melted pitch to keep the water from rotting it.

**Caulopteris** (kạl-op'tèr-is), a genus of fossil tree-ferns found in the coal-measures.

**Cause** (kạs), that which produces an effect; that from which anything proceeds and without which it would not exist. In the system of Aristotle the word rendered by cause and its equivalents in modern language has a more extensive signification. He divides causes into four kinds: efficient, formal, material, and final. The efficient or first cause is the force or agency by which a result is produced; the formal, the means or instrument by which it is produced; the material, the substance from which it is produced; the final, the purpose or end for which it is produced. In a general sense the term is used for the reason or motive that urges, moves, or impels the mind to act or decide.

**Caustic** (kạs'tik; Greek *kaustikos*, burning, from *kaiō*, I burn), a name given to substances which have the property of burning, corroding, or disintegrating animal matter; or of combining with the principles of organized substances and destroying their texture.—*Lunar Caustic*, a name given to nitrate of silver when cast into sticks for the use of surgeons, etc.—*Caustic potash*, the hydrate of potassium.—*Caustic soda*, hydroxide of sodium.

**Caustic**, in optics, the name given to the curve to which the rays of light, reflected or refracted by another curve, are tangents. Caustics are consequently of two kinds—*catacaustics* and *diacaustics*—the former being caustics by reflection and the latter caustics by refraction.

**Cauterets** (kōt-rā), a celebrated bathing locality in France, dep. Hautes-Pyrénées.

**Cautery** (kạ'te-ri), in surgery, the searing or burning of living flesh by a hot iron (*actual* cautery), an electrically heated wire (*electric* cautery), or a caustic substance (*potential* cautery).

**Caution** (kạ'shun), a legal term signifying much the same as guarantee or security, now mostly used in Scots law.

**Cauvery.** See *Cavery*.

**Cava** (kä'vä), a town of South Italy, 3 miles N.W. of Salerno, with manufactures of silk, cotton, and linen. About 1 mile from Cava is a magnificent Benedictine convent. Pop. 7611.

**Cavaignac** (kä-van-yäk), Louis Eugène, a French general, born in 1802; died in 1857. His father, Jean Baptiste Cavaignac, was a furious revolutionist and member of the Council of Five Hundred. Young Cavaignac in 1824 joined the 2d Regiment of Engineers, and being at Arras on the outbreak of the revolution of 1830 he was the first officer in his regiment to declare for the new order of things. In 1832 he was sent to Africa, where he remained for several years, and greatly distinguished himself. When the revolution of 1848 broke out Cavaignac was appointed Governor-general of Algeria; but on being elected a member of the Constituent Assembly he returned to Paris and was appointed minister of war. At the outbreak of the June insurrection Cavaignac was appointed dictator with unlimited powers. For three days Paris presented a dreadful scene of tumult and bloodshed. About 15,000 persons perished, and property was destroyed to the value of upwards of $1,000,000. By the energy of Cavaignac, aided by the loyalty of the army and the National Guard, the insurrection was suppressed, and France saved from a threatened dissolution of all the bonds of society. Towards the close of the year he became a candidate for the presidency of the republic, but was defeated, and Louis Napoleon was preferred to the office. On 20th December he resigned his dictatorship. After the *coup d'état* of 2d December, 1851, he was arrested and conveyed to the fortress of Ham, but was liberated after about a month's detention. In 1852 and in 1857 he was elected member for Paris of the legislative body, but on both occasions was incapacitated from taking his seat by refusing to take the oath of allegiance to the emperor.

**Cavaillon** (kä-vä-yōn), a town of Southern France, dep. Vaucluse, 14 miles S.E. Avignon, an important railway junction. Pop. 5760.

**Cavalcanti** (kav-al-kan'ti), Guido, a Florentine philosopher and poet, born in the early part of the thirteenth century; died 1300. He was the friend of Dante, and, like him, a zealous Ghibelline. His *Canzone d'Amore* have gained him the most fame.

**Cavalier** (ka-va-lēr'), a horseman, especially an armed horseman; applied in history to the partisans of Charles I, as opposed to Roundheads, the adherents to the Parliament.

**Cavalier**, in fortification, a work commonly situated within the bastion, but sometimes placed in the gorges or on the middle of the curtain. It is 10 or 12 feet higher than the rest of the works, and is used to command

all the adjacent works and the surrounding country.

**Cavalier** (kȧ-vȧ-lyā), JEAN, leader of the Camisards in the war of the Cevennes, son of a peasant, born in 1679 near Anduze (department of Gard); died at Chelsea 1740. He was engaged in agricultural labors at Geneva when the cruel persecutions of the Protestants of the Cevennes by Louis XIV induced him to return home. He became their leader, and, led by him, they forced Marshal Villars to make a treaty with them. Cavalier then accepted a commission in the king's service, but, fearing treachery, he retired to England, and took service under the Earl of Peterborough and Sir Cloudsley Shovel in Spain. He commanded a regiment of refugee Camisards, and distinguished himself greatly at the battle of Almanza, in New Castile, in 1707, where he was severely wounded. He was afterwards appointed governor of Jersey.

**Cavalry** (kav'al-ri), a body of troops which serve on horseback, one of the three great classes of troops, and a formidable power in the hands of a leader who knows how to employ it with effect. Its adaptation to speedy movements is a great advantage, which enables a commander to avail himself immediately of a decisive moment when the enemy exposes a weak point or when disorder appears in his ranks. It is a very important instrument in completing the defeat of an enemy, in disconcerting him by a sudden attack, or overthrowing him by a powerful shock. It is very serviceable in protecting the wings and center of an army, for escorts, for blockading, for intercepting the supplies of the enemy, for procuring intelligence, for covering a retreat, for foraging, etc. Cavalry are usually armed with straight swords or sabers, pistols, and carabines.

**Cavan** (kav'an), an inland Irish county in Ulster; area, 730 sq. miles, of which three-fourths are arable. The northwestern part is hilly; the remaining surface, which is undulating and irregular, is pervaded by bog and interspersed with many lakes; the soil is generally poor. Oats, flax, and potatoes are the chief crops. The principal towns are Cavan, Cootehill, and Belturbet. The county returns two members to parliament. Pop. 97,541.—CAVAN, the county town, 57 miles S. W. Dublin, has a courthouse, endowed school founded by Charles I, a Roman Catholic college, etc., and a considerable trade in farm produce. Pop. about 2800.

**Cavatina** (kav-a-tē'na), in music, a melody of simpler character than the *aria*, and without a second part and a *da capo* or return part. The term is occasionally applied, however, to short simple airs of any kind.

**Cave** (kāv) or CAVERN, an opening of some size in the solid crust of the earth beneath the surface. Caves are principally met with in limestone rocks, sometimes in sandstone and in volcanic rocks. Some of them have a very grand or picturesque appearance, such as Fingal's Cave in Staffa; others, such as the Mammoth Cave of Kentucky, which incloses an extent of about 40 miles of subterranean windings, are celebrated for their great size and subterranean waters; others for their gorgeous stalactites and stalagmites; others are of interest to the geologist and archæologist from the occurrence in them of osseous remains of animals no longer found in the same region, perhaps altogether extinct, or for the evidence their clay floors and rudely-sculptured walls, and the prehistoric implements and human bones found in them, offer of the presence of early man. Caves in which the bones of extinct animals are found owe their origin, for the most part, to the action of rain-water on limestone rocks. The deposit contained in them usually consists of clay, sand, and gravel combined. In this are embedded the animal remains, and stones either angular or rounded. Some of the remains found in European caverns belong to animals now found only in the tropical or subtropical regions and others are the remains of animals now living in more northerly areas; others, again, are the relics of extinct animals. Among the latter class of animals are the cave bear and lion, the mammoth and mastodon, species of rhinoceros, etc. Of others that have only migrated may be mentioned the reindeer, which is no longer found in Southern Europe; and the *Hyæna crocuta*, found in the Gibraltar caves, which now lives in South Africa. The ibex, the chamois, and a species of ground squirrel are shown to have once lived in the Dordogne, but are now found only on the heights of the Alps and Pyrenees. Thus it is evident that the geographical conditions of the country must have been very different from what they are now. Man's relation to these extinct animals, and his existence at the time these changes took place, are demonstrated by such discoveries as those of human bones and worked flints beneath layers of hyena droppings, as in Wokey's Hole, near Wells, England; mixed up indiscriminately, as in Kent's Hole, near Torquay, with bones of elephant, rhinoceros, hyena, etc.; and by the fact that many bones of

the extinct animals are split up, evidently for the sake of the marrow. In the Dordogne and Savigné caves, fragments of horn have been found bearing carved, or rather deeply scratched, outline figures of ibex, reindeer, and mammoth. Among the most remarkable bone-caves are those of Kirkdale, in Yorkshire; Kent's Hole, Wokey's Hole; of Franconia, in Bavaria; the banks of the Meuse, near Liège; and the south of France. See *Cave-men*.

**Cave,** EDWARD, an English printer, the founder of the *Gentleman's Magazine*, was born in 1691; died in 1754. The first number of the *Gentleman's Magazine*, which, under a considerably modified form, has continued till this day, was published in Jan., 1731. Cave is also remembered as the first to give literary work to Samuel Johnson.

**Caveat** (kā'vē-at; L., 'let him beware'), in law, a process in a court to stop proceedings, as to prevent the enrollment of a decree in chancery in order to gain time to present a petition of appeal to the lord-chancellor. In the United States this name is given to a notice lodged in the patent-office by a person who wishes to patent an invention, but desires to be protected till he has perfected it. It stands good for a year.

**Cave-men,** prehistoric races who lived in such accessible caves as those mentioned in article *Cave*. That they were at a low state of civilization, though possessed of some artistic faculty, is evidenced by the fact that they were ignorant of the metals, of pottery, and of agriculture, and had no domestic animals. Their chief food seems to have been the reindeer, and their manner of life was probably somewhat similar to that of the Esquimaux.

**Cavendish** (kav'en-dish), tobacco which has been softened and pressed into quadrangular cakes, so called from Thomas Cavendish, the Elizabethan circumnavigator.

**Cavendish,** HENRY, an English physicist and chemist, born at Nice in 1731; died at London in 1810; the son of Lord Charles Cavendish, and grandson of the second Duke of Devonshire. He devoted himself exclusively to science, and greatly contributed to the progress of chemistry, having discovered the peculiar properties of hydrogen, the composition of water, etc. He also wrote on electricity, and determined the mean density of the earth. His writings consist of treatises in the *Philosophical Transactions*.

**Cavendish,** or CANDISH, THOMAS, an English circumnavigator in the reign of Elizabeth; born about 1555; died in 1592. Having collected three small vessels for the purpose of making a predatory voyage to the Spanish colonies, he sailed from Plymouth in 1586, took and destroyed many vessels, ravaged

Thomas Cavendish.

the coasts of Chile, Peru, and New Spain, and returned by the Cape of Good Hope, having circumnavigated the globe in two years and forty-nine days, the shortest period in which it had then been effected. In 1591 he set sail on a similar expedition, during which he died.

**Cavendish,** WILLIAM, Duke of Newcastle, was born in 1592; died in 1676. Son of Sir Charles Cavendish, he was made Earl of Newcastle by Charles I. On the approach of hostilities between the crown and parliament he embraced the royal cause, and was invested with a commission constituting him general of all his majesty's forces raised north of the Trent, with very ample powers. Through great exertions and the expenditure of large sums from his private fortune he levied a considerable army, with which, for some time, he maintained the king's cause in the north. When the royal cause became hopeless he retired to Holland. He returned after an absence of eighteen years, and was rewarded for his services and sufferings with the dignity of duke. He was the author of several mediocre poems and plays, and a treatise on horsemanship.

**Cavendish,** WILLIAM, first Duke of Devonshire, a distinguished statesman and patriot, was born 1640; died 1707. On various occasions he distinguished himself by his spirit and valor, and in 1677 began that opposition to the arbitrary measures of the ministers of Charles II which caused him to be regarded as one of the most determined

friends of the liberties of his country. He took an active part in promoting the revolution, and was one of the first who declared for the Prince of Orange. His services were rewarded with the dignity of duke.

**Cavendish Experiment,** an important scientific experiment first made by the celebrated Henry Cavendish, for the purpose of ascertaining the mean density of the earth by means of the torsion balance.

**Cavery** (kȧ'ver-i), or CAUVERY, a river of Southern India, which, after a winding S. E. course of about 470 miles, falls into the Bay of Bengal by numerous mouths. It is known to devout Hindus as the Ganges of the South, and is largely utilized for irrigation purposes.

**Caverypauk** (kȧ-ver-e-pȧk'), a town of Hindustan, North Arcot district, Madras Presidency, where Clive gained a victory over the French in 1752. It is notable for a splendid work of irrigation, an artificial lake 8 miles long and 3 miles wide. Pop. 5478.

**Cave-temple,** a cave used as a temple; but the name is especially applied to temples excavated in the solid rock, such as exist in considerable numbers in India. See *Elephanta, Ellora.*

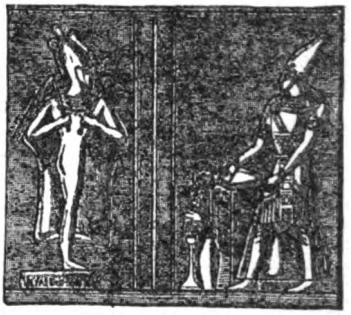
**Caviare** (kav'i-ār), the roes of certain large fish prepared and salted. The best is made from the roes of the sterlet and sturgeon, caught in the lakes or rivers of Russia.

**Cavicornia** (kav-i-kor'ni-a), CAVICORNS (L. *cavus*, hollow, and *cornu*, a horn), a family of ruminants, characterized by persistent horns (thus differing from the deer) consisting of a bony core and a horny sheath or case covering the bone, in both sexes or in males only. They comprise the antelopes, goats, and oxen. In various species, as the antelopes, the bony nucleus has no internal cavity; in others, as the ox and goat, it is hollow.

**Cavidæ** (kav'i-de), the guinea-pig tribe. See *Cavy.*

**Cavite** (kȧ-vē'tȧ), a town in the island of Luzon, one of the Philippines; situated on the Bay of Manila, about 11 miles S. W. of Manila. Its docks and arsenal were once famous. It was seized by Commodore Dewey after the battle of Manila, as a base of supplies and of convalescence for his sick and wounded. It is retained as such by the United States. Pop. of town 5000.

**Cavo-rilievo** (It. kȧ'vō-ri-li-ā'vō), in sculpture, a kind of relief in which the highest surface is only level with that of the original stone, giving an effect like the impression of a seal in wax. It is also called *intaglio rilievato*



Cavo-rilievo.—Wall Sculpture, Great Temple of Philæ, Egypt.

**Cavour** (kȧ-vōr'), COUNT CAMILLO BENSO DI, a distinguished Italian statesman, was born at Turin in 1809 or 1810; died 1861. He was educated in the military academy at Turin, and after completing his studies he made a journey to England, where he remained for several years, making himself acquainted with the principles and working of the British constitution, and forming friendships with some of the most distinguished men. He became a member of the Sardinian Chamber of Deputies in 1849, and the following year minister of commerce and agriculture. In 1852 he became premier, and not long afterwards took an active part in cementing an alliance with Great Britain and France, and making common cause with these powers against Russia during the Crimean War. The attitude, however, thus taken by Sardinia could not fail to prove offensive to Austria. A collision, therefore, was inevitable, resulting in the campaign of 1859. The intimate connection formed at that time with France, which lent powerful assistance in the prosecution of the war, was mainly due to the agency of Cavour, who was accused by some on this occasion of having purchased the assistance of Napoleon III by unduly countenancing his ambitious projects. In 1860 Garibaldi's expedition to Sicily took place; but towards this and the subsequent movements of the Italian liberator Count Cavour was forced to maintain an apparent coldness. He lived to see the meeting of the first Italian Parliament, which decreed Victor Emmanuel King of Italy.

**Cavy** (kā'vi), the popular name for a genus of rodent animals

(*Cavia*), family Cavidæ, characterized by molars without roots, forefeet with four toes, hinder with three, and the absence of a tail and clavicles. They are natives of tropical America, the most familiar example of this genus being the guinea-pig (which see).

**Cawnpore** (kąn-pōr'), a town of India, Northwest Provinces, on the right bank of the Ganges, which is here about a mile wide, 130 miles N. W. from Allahabad. It has manufactures of leather and cotton goods and a large trade. Including the native city, cantonments, and civil station, it has a population of 197,170.

It was the scene of the greatest tragedy in the Sepoy mutiny. In 1857 the native regiments stationed here mutinied and marched off, placing themselves under the command of the Rajah of Bithoor, the notorious Nana Sahib. General Wheeler, the commander of the European forces, defended his position for some days with great gallantry, but, pressed by famine and loss of men, was at length induced to surrender to the rebels on condition of his party being allowed to quit the place uninjured. This was agreed to; but after the European troops, with the women and children, had been embarked in boats on the Ganges, they were treacherously fired on by the rebels; many were killed, and the remainder conveyed back to the city, where the men were massacred and the women and children placed in confinement. The approach of General Havelock to Cawnpore roused the brutal instincts of the Nana, and he ordered his hapless prisoners to be slaughtered, and their bodies to be thrown into a well. The following day he was obliged, by the victorious progress of Havelock, to retreat to Bithoor. A memorial has since been erected over the scene of his atrocities, and fine public gardens now surround the well.

**Caxamarca,** or CAJAMARCA (kä-*hä*-mär'-kä), a department and town of Peru; area of the department about 14,200 square miles; pop. 213,400. The town is situated about 70 miles from the Pacific Ocean, 280 N. Lima. Pop. 12,000. It was the scene of the imprisonment and murder of Atahualpa, the last of the Incas.

**Caxias** (kä-shē'äs), a town of Brazil, province Maranhao, on the Itapicuru, which is here navigable. Pop. 10,000.

**Caxton** (kaks'ton), WILLIAM, the introducer of the art of printing into Britain, was born in the Weald of Kent about 1422; died at Westminster 1491. He served an apprenticeship to Robert Large, a London mercer. On the death of his master, Caxton went into business for himself at Bruges. He was afterwards appointed governor at Bruges to the London Association of Merchant Adventurers. He appears subsequently to have held some office in the household of Charles, Duke of Burgundy, whose wife, the Lady Margaret of York, distinguished herself as the patroness of Caxton. He had translated the popular mediæval romance *Le Recueil des Histoires de Troye* (Collection of the Histories of Troy), and in order to multiply copies he learned the newly-discovered art of printing. It was printed either at Cologne or Bruges about 1474, and is the earliest specimen of typography in the English language. The *Game and Playe of the Chesse*, Bruges, 1475, is the second English book printed. In 1476 he returned to England, and in 1477 printed at Westminster *the Dictes and Sayings of the Philosophers*, the first book printed in England. In fourteen years he printed nearly 80 separate books, nearly all of folio size, some of which passed through two editions, and a few through three. He translated twenty-one books, mainly romances, from the French, and one (*Reynard the Fox*) from the Dutch, helping materially to fix the literary language of the 16th century. He was buried in the Church of St. Margaret, Westminster.

**Cayenne** (kī-en'), the capital of the colony of French Guiana, is a seaport on an island of same name at the mouth of the Cayenne River. It was a noted penal settlement, has a large but shallow harbor, and contains 12,357 inhabitants.

**Cayenne Pepper,** or CAPSICUM, the name given to the powder formed of the dried and ground fruits, and more especially the seeds, of various species of *Capsicum*, and especially of *C. frutescens*. It is employed as a condiment to improve the flavor of food, aid digestion, and prevent flatulence. In medicine it is used as a stomachic. See *Capsicum*.

**Caylus** (kā-lüs), ANNE CLAUDE PHILIPPE DE TUBIÈRES, etc., COUNT, French archæologist, born in 1692 at Paris; died in 1765. After having served in the army, he traveled extensively in Europe and the East. He left numerous works, tales as well as antiquarian researches. Among the latter is his *Recueil d'Antiquités Egyptiennes*, etc. (Paris, 1752–67, seven vols.). Caylus was also an industrious and skillful engraver, after the first masters. His mother, Marquise de Caylus (1673–

1729), niece of Madame de Maintenon, made herself known by a spirited little work, *Mes Souvenirs.*

**Cayman** (kī-man'). See *Alligator.*

**Cayman Islands,** three islands situated about 140 miles N. W. of Jamaica, of which they are dependencies. Area 225 sq. miles; pop. 4322. Grand Cayman, the largest and the only one inhabited, is 20 miles long and from 7 to 10 broad, and has two towns or villages. The inhabitants, partly descendants of the buccaneers, are chiefly employed in catching turtle. The other two islands are Little Cayman and Cayman Brac.

**Cayuga Lake** (ka-yō'ga), a lake in the State of New York, 38 miles long and from 1 to 3½ miles wide. It is much frequented by pleasure parties. Ithaca, the seat of Cornell University, and Aurora, the seat of Wells College, are situated upon its banks.

**Cazalla-da-la-sierra** (kȧ-thȧl'yȧ), a town of Andalusia, Spain, in the province and 36 miles N. by E. of Seville, on a declivity of the Sierra Morena, which is here rich in timber and metals. Pop. 7782.

**Cazembe's** (kȧ-zem'be) DOMINION, a former native state of Central South Africa, lying between the rivers Luapula and Lualaba, west of Lake Bangweolo, and now included in the Congo State. It is a land of forest-covered sandstone ridges and grass plains, intersected by streams flowing northwards. The country is vassal to the Muata Yamvo, the hereditary chief of Ulunda. Cassava, maize, sorghum, and cotton are cultivated.

**Cazorla** (kȧ-thor'lȧ), a town of Andalusia, Spain, in the province and 41 miles E. of Jaen, with 7936 inhabitants.

**Cazotte** (kȧ-zot), JACQUES, a French writer, born in 1720; executed by the revolutionists in 1792. He became first known by a romance of chivalry, *Ollivier*, published in 1763; and subsequently his *Diable Amoureux*, the *Lord Impromptu*, and *Œuvres Morales et Badines*, gave proof of his rich imagination. With the assistance of an Arabian monk he translated four volumes of *Arabian Tales*—a continuation of the *Arabian Nights.*

**Ceará** (sȧ-ȧ-rȧ'), a province on the north coast of Brazil; area, 40,253 square miles. Among its productions are numerous medicinal plants, gums, balsams, and resins; cotton, coffee, sugar-cane, etc., are cultivated. The first Portuguese colony in Ceará was founded in 1610, in the neighborhood of Fortaliza (formerly Ceará), the capital. This town is situated on the coast, and carries on a considerable trade in rubber, coffee, sugar, etc. Pop. of prov. 849,127; of town about 33,000.

**Cebadilla.** See *Sabadilla.*

**Cebu** (thā-bö'), one of the Philippine Islands, lying between Luzon and Mindanao. 135 miles long, with an extreme width of 30 miles. Sugar cultivation and the manufacture of abaca are the chief industries. Pop. 653,700. The town of Cebu, on the eastern coast of the island, the oldest Spanish settlement on the Philippines, is a place of considerable trade; it was captured from the insurgents Sept. 22, 1899.

**Cebus** (sē'bus), a genus of monkeys. See *Capuchin* and *Sapajou.*

**Cecco d'Ascoli** (chek-o-d ȧ s'k o-l ē), whose proper name was FRANCESCO DEGLI STABILI, an Italian poet, born at Ascoli in 1257; burned at Florence in 1327. His chief work, *L'Acerba*, a kind of poetic cyclopedia, passed through many editions. He adversely criticised the writings of Dante and Cavalcante and suffered death at the hands of the Inquisition for alleged heterodoxy.

**Cecidomyia** (se-si-dō-mī'i-a), the genus of insects to which the Hessian fly belongs.

**Cecil** (ses'il), ROBERT, Earl of Salisbury, English statesman, second son of William Cecil, Lord Burleigh, born about 1563. He was of a weak constitution, on which account he was educated at home till his removal to the University of Cambridge. Having received the honor of knighthood, he went to France as assistant to the English ambassador. On the death of Sir Francis Walsingham he succeeded him as principal secretary, and continued to be a confidential minister of Queen Elizabeth to the end of her reign. Having secretly supported the interests of James I previous to his accession to the crown he was continued in office under the new sovereign and raised to the peerage. In 1603 he was created a baron, in 1604 Viscount Cranbourn, and in 1605 Earl of Salisbury. In 1608 Lord Salisbury was made lord high-treasurer, an office which he held till his death in 1612.

**Cecil,** WILLIAM, Lord Burleigh, an eminent English statesman, was the son of Richard Cecil, master of the robes to Henry VIII, and was born at Bourne, in Lincolnshire, in 1520; died 1598. He studied at St. John's College,

Cambridge, whence he removed to Gray's Inn, with a view to prepare himself for the practice of the law, but an introduction to the court of Henry VIII changed his aims. On the accession of Edward VI his interests were advanced by the protector Somerset, whom he accompanied in the expedition to Scotland. He held no public office during the reign of Mary, and by extraordinary caution managed to escape persecution. On the accession of Elizabeth he was appointed privy-councilor and secretary of state, and during all the rest of his life he was at the helm of affairs. One of the first acts of her

William Cecil, Lord Burleigh.

reign was the settlement of religion, which Cecil conducted with great skill and prudence, considering the difficulties he encountered. The general tenor of Cecil's policy was cautious, and rested upon an avoidance of open hostilities, and a reliance on secret negotiation and intrigues with opposing parties in the neighboring countries, with a view to avert the dangers which threatened his own. On the suppression of the northern rebellion in 1571 Elizabeth raised him to the peerage by the title of Baron Burleigh. Much of the glory of the reign of Elizabeth is due to the counsels and measures of Cecil. His character in private life was very attractive.

**Cecilia** (se-sil'i-a), SAINT, the patron saint of music, who has been falsely regarded as the inventress of the organ, and who is said to have suffered martyrdom A.D. 230, although other dates are given. In the Roman Catholic Church her festival (Nov. 22) is made the occasion of splendid music. Her story forms one of Chaucer's *Canterbury Tales*, and Dryden, in his *Alexander's Feast*, and Pope, in his *Ode on St. Cecilia's Day*, have sung her praises. Raphael, Domenichino, Dolce, and Mignard have represented her in celebrated paintings.

**Cecropia** (se-kro'pi-a), a genus of beautiful South American trees, nat. order Artocarpaceæ (bread-fruits). *C. peltāta*, or trumpet-wood, is remarkable for its hollow stem and branches, the former being made by the Indians into a kind of drum and the latter into wind-instruments. The light, porous wood is used by the Indians for procuring fire by friction. The inner bark is fibrous and strong, and used for cordage. This species yields caoutchouc.

**Cecropia Moth** (*Platysamia cecropia*), the largest moth of the U. States. It belongs to the silkworm family, and its caterpillar spins a large cocoon from which a coarse silk may be prepared.

**Cecrops** (kē'krops), according to tradition, the founder of Athens and the first king of Attica. He was said to have taught the savage inhabitants religion and morals, and made them acquainted with the advantages of social life. By the later Greeks he was represented as having led a colony to Attica from Egypt about 1400 or 1500 B.C., but modern critics do not look upon this event or on the life of Cecrops at all as historical.

**Cecrops,** a genus of parasitic entomostracous crustaceans, found on the gills of the tunny and turbot, and called by fishermen fish-lice.

**Cedar** (sē'dar), a tree which forms fine woods on the mountains of Syria and Asia Minor, the *Pinus Cedrus* of Linnæus, the *Cedrus Libāni* of some other botanists, while by others it is referred to the genus *Laricæ*, and by others again, along with the larch, to the genus *Abies*. It is an evergreen, grows to a great size, and is remarkable for its durability. Of the famous cedars of Lebanon comparatively few now remain, and the tree does not grow in any other part of Palestine. The most celebrated group is situated not far from the village of Tripoli, at an elevation of about 6000 feet above the sea. The circumference of the twelve largest trees here varies from about 18 to 47 feet. Cedar timber was formerly much prized, but in modern times is not regarded as of much value, perhaps from the trees not being of sufficient age. The name is given also to the deodar (*C. Deodāra*), which is indeed regarded by many botanists as a mere variety of the cedar of Lebanon, and which produces excellent timber. It is a native of India,

and is a large and handsome tree, growing in the Himalayas to the height of 150 feet, with a circumference of 30. It has wide-spreading branches, which droop a little at the extremities. The leaves are tufted or solitary, larger than those of the cedar of Lebanon and very numerous, of a dark-bluish green, and covered with a glaucous bloom. The cones are rather

Cedar of Lebanon.

larger than those of the Lebanon cedar, and very resinous. The wood is well adapted for building purposes, being compact and very enduring. The deodar was introduced into Great Britain in 1822, and is now common in lawns and parks. The Mount Atlas cedar (*C. Atlantica*), as its name implies, is a native of the mountains of North Africa. This cedar, though differing in habit and minor features, is regarded by some botanists as specifically identical with the other two. The name is also applied to many trees which have no relation to the true cedar, as the Bermuda cedar (*Juniperus Bermudiana*), red cedar, and the Virginian or red cedar of the United States (*J. Virginiana*), these two yielding the wood used for lead pencils, the Honduras, or bastard Barbadoes cedar (*Cedrela odorata*), and the red cedar of Australia (*C. Australis*). See *Cedrela*. A species of fir (*Abies religiosa*) is the red cedar of California.

**Ce'darbird,** a name given to the American waxwing (*Ampelis Americanus* or *Bombycilla Carolinensis*), from its fondness for the berries of the red cedar. It is a handsome and sprightly bird, found throughout the whole of the United States, but has no song.

**Cedar Creek,** a stream in Shenandoah Co., Virginia, near which General Sheridan converted a defeat of the Federals by the Confederates into a famous victory, Oct., 1864.

**Cedar Falls,** a city of Black Hawk Co., Iowa, 60 miles N. w. of Cedar Rapids; has important manufacturing industries. Pop. 5012.

**Cedar Lake,** a lake in Canada, an expansion of the Saskatchewan before it enters Lake Winnipeg; nearly 30 miles long, and where widest 25 broad.

**Cedar Oil,** an aromatic oil obtained from the American red cedar (*Juniperus Virginiana*), and used in microscopical work to aid in avoiding refraction of light between object and lens.

**Cedar Rapids,** a flourishing city of Iowa, on Cedar River, with large railway machine-shops and numerous industrial establishments, including a large cereal plant and pork-packing abattoirs. The name comes from the rapids of the Cedar, which furnish motive power. Pop. 32,811.

**Cedilla** (sē-dil'a), a mark used under the letter *c*, especially in French (thus ç), to indicate that it is to be pronounced like the English *s*.

**Cedrela** (se-drē'la), a genus of large timber trees, natives of the tropics of both hemispheres, order Cedrelaceæ. *C. odorata* of Honduras and the W. Indies yields bastard cedar; *C. Australis* is a valuable Australian timber tree; one or two E. Indian species have febrifugal properties.

**Cedrelaceæ** (se-dre-lā'se-ē), the mahogany family, a nat. order of dicotyledonous plants, nearly allied to, if really separate from, the Meliaceæ. They are trees with alternate pinnate leaves and a woody capsular fruit. Different species yield mahogany, satin-wood, yellow-wood, etc.

**Cedrus.** See *Cedar*.

**Cefalonia.** See *Cephalonia*.

**Cefalu** (chef'ā-lō), a seaport and bishop's see on the north coast of Sicily. The trade is trifling, but a productive fishery is carried on, and there are rich marble quarries in the vicinity. Pop. 13,273.

**Celandine** (sel'an-dīn), a name given to two plants, the greater celandine and the lesser celandine; also called *swallow-worts*, because the plants

were believed to flower when the swallow arrived, and to die when it departed. The former is *Chelidonium majus*, and the latter *Ficaria ranunculoides* or *Ranunculus Ficaria*. This latter is a favorite wild flower from its being one of the earliest plants to come into blossom, having petals of a fine golden-yellow color. Its root consists of small, fleshy tubers. It is often called pilewort, being a reputed cure of piles. The greater celandine belongs to the poppy family; it is full of a yellow juice of a poisonous, acrid nature.

**Celano** (che-lä'nō), LAKE OF. See *Fucino*.

**Celano** (che-lä'nō), TOMMASO DA, one of the reputed authors of the Latin Hymn *Dies Iræ*, was born towards the end of the 12th or about the beginning of the 13th century, at Celano, in the Abruzzi, and died in Italy after 1250. He was one of the most devoted adherents of St. Francis of Assisi, whose life he wrote.

**Celastraceæ** (se-las-trā'se-ē), an order of polypetalous dicotyledons, consisting of shrubs and small trees, natives of S. Europe, Asia, America, Australia, etc., most of them of no great importance. See *Spindle-tree*.

**Celebes** (sel'e-bēz), one of the larger islands of the Indian Archipelago, between Borneo on the W. and the Moluccas on the E. It consists mainly of four large peninsulas stretching to the E. and S., and separated by three deep gulfs; area, about 72,000 sq. miles. No part of it is more than 70 miles from the sea. Celebes is mountainous chiefly in the center and the north, where there are several active volcanoes. It has also broad, grassy plains and extensive forests. Gold is found in all the valleys of the north peninsula, which also abounds in sulphur. Copper occurs at various points, and in Macassar tin also. Diamonds and other precious stones are found. The island is entirely destitute of feline or canine animals, insectivora, the elephant, rhinoceros, and tapir (though these are found in Borneo); but it has the antelopean buffalo (*Anoa*), the spiral-tusked pig (*Babyroussa*), etc. Among domesticated animals are small but vigorous horses, buffaloes, goats, sheep, and pigs. Trepang and turtle are caught in abundance. Marsupial animals are represented by the cuscus, an opossum-like animal with a prehensile tail. Among the trees are the oak, teak, cedar, upas, bamboo, etc. Among cultivated plants are the coffee-tree, indigo, cacao, sugar-cane, manioc root, tobacco, etc. The maritime districts are inhabited by Malays; the Peninsula of Macassar is occupied by semicivilized tribes known as Bugis and Macassars. Mandhars dwell in the W. of the island, and the mountainous regions in the interior, especially in the N., are inhabited by Alfoories. The inhabitants may be classed into two groups: the Mohammedan semicivilized tribes, and the pagans, who are more or less savages. The capital is Macassar, in the S. W. of the island. The trade in trepang is very important, Macassar being the chief staple place for this article of commerce. The three great languages of the island, not reckoning the dialects of the savage tribes, are those of the Bugis, the Macassars, and the Mandhars. The ancient Bugi is the language of science and religion. The Bugis have a considerable body of literature. Celebes was first visited by the Portuguese in 1512, but no factory was established by them there till a few years later. In 1660 Macassar was taken by the Dutch, the southern portion of the island put under Dutch rule, and the Portuguese expelled. In 1683 the northern part likewise fell into their hands. The island was conquered by the British in 1811, but a few years later it was again given up to the Dutch, in whose possession it has remained ever since. The population is estimated at about 2,000,000.

**Celeres** (sel'e-rēs), in Roman antiquity, a body of 300 horsemen, formed by Romulus from the wealthier citizens. Their number was afterwards augmented, and they are thought to have been the origin of the *equites*.

**Celeriac** (se-lēr'i-ak), turnip-rooted celery, a variety of celery in which the root resembles a turnip and may weigh 3 or 4 lbs. It is not earthed up, but is grown upon the surface of the ground, and kept free from weeds by frequent hoeing.

**Celery** (sel'e-ri), an umbelliferous plant (*Apium graveŏlens*) indigenous in the temperate parts of Europe. In its native station it has the character of being a poisonous plant, but transplanted to a garden it becomes a wholesome and much esteemed vegetable. It is much cultivated in the United States, principally two varieties, red and white stalked, and of these many subvarieties, being grown. Celery is commonly blanched by heaping up the soil about the plants.

**Celery Fly** (*Tephritis Onopordinis*), a two-winged fly, the larvæ of which are destructive to celery and parsnip.

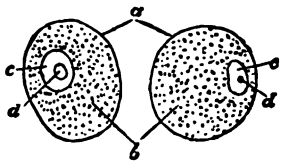
**Celestine** (sel'es-tin; $SrSO_4$), the native sulphate of strontium, a mineral which occurs associated with sulphur and finely crystallized in the Sicilian sulphur mines. It is transparent and colorless, though specimens are met with of a yellow or red color, while others are of a fine blue. It is from this variety that the mineral has obtained its name.

**Celestine** (sel'es-tin), the name of five popes. CELESTINE I was elected pope in 422, died in 432, and is recognized by the church as a saint.—CELESTINE II, a native of Tuscany, who had studied under Abelard, filled the papal chair for five months in 1143–44. He granted absolution to Louis VII of France, and removed the interdict which for three years was laid upon that country.—CELESTINE III, one of the Orsini family, was elected pope in 1191, when, it is believed, about ninety years of age, and lived till 1198. He crowned the emperor Henry VI, but afterwards excommunicated both Henry and Leopold, Duke of Austria, on account of the captivity of Richard Cœur de Lion.—CELESTINE IV, a Milanese, who, when a monk, wrote a history of Scotland, was elected pope in 1241, but held office only seventeen days.—CELESTINE V was chosen pope July 5, 1294, but abdicated his dignity Dec. 13, 1294, and died May 19, 1296. He is the founder of the Celestines, and was canonized in 1313 by Clement V.

**Celestines** (from their founder, Pope Celestine V), a religious order instituted about the middle of the 13th century, in Italy, who followed the rule of St. Benedict, and were devoted entirely to a contemplative life. Very few priories of this once-numerous order now exist.

**Celibacy** (sel'i-ba-si), the state of being celibate or unmarried; specially applied to the voluntary life of abstinence from marriage followed by many religious devotees and by some orders of clergy, as those of the Roman Catholic Church. The ancient Egyptian priests preserved a rigid chastity; the priestesses of ancient Greece and Rome were pledged to perpetual virginity; and celibacy is the rule with the Buddhist priests of the East. Among Christians the earliest aspirants to the spiritual perfection supposed to be attainable through celibacy were not ecclesiastics as such, but hermits and anchorites who aimed at superior sanctity. During the first three centuries the marriage of the clergy was freely permitted, but by the Council of Elvira (305) continence was enjoined on all who served at the altar. For centuries this subject led to many struggles in the church, but was finally settled by Gregory VII positively forbidding the marriage of the clergy. The Council of Trent (1593) confirmed this rule. In the Greek Church celibacy is not compulsory on the ordinary clergy. Protestants hold that there is no moral superiority in celibacy over marriage, and that the church has no right to impose such an obligation on any class of her ministers.

**Cell,** a term of various applications. (1) Ecclesiastically it was sometimes applied to a lesser or subordinate religious house, dependent upon a greater. The apartments or private dormitories of monks and nuns are also called *cells*. From this use it has become applied to prison rooms or dungeons. The term *cell* is applied also to the part of the interior of a temple where the image of a god stood. (2) In electricity, the term is applied to a single jar, bath, or division of a compound vessel, containing a couple of plates, generally copper and zinc, united to their opposites or to each other, usually by a wire. (3) In biology, a *cell* is a microscopically small semifluid portion of matter, consisting of a soft mass of living, contractile, jelly-like matter, and a central structure, consisting of a small, roundish body, called the *nucleus*, generally more solid than the rest of the cell, and which may have within it a still more minute body, the *nucleŏlus*. The cell substance or protoplasm (see *Protoplasm*) which surrounds the nucleus is an albuminous substance, while the nucleus is largely made up of anastomosing fibers, which are looked upon as the starting points in the development of new cells and the growth of organisms. The cell-wall when present consists of an alteration of the external portion of the cell body, and is not a separate structure. All cells have but a very limited duration; so the tissues are being constantly renewed.




CELLS OF ROUND OR OVAL FORM.

*a*, Border of the cell or cell-wall; *b*, cell substance; *c c*, nuclei; *d d*, nucleoli.

**Cella,** part of a temple. See *Cell*.

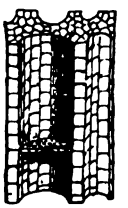
**Cellardyke.** See *Anstruther*.

**Celle** (tsel'le), a town in Prussia, province of Hanover, 23 miles N. E. of the town of Hanover, in the midst of a sandy plain, at the confluence of the Fuse with the Aller, which is navigable. The manufactures are varied, and the trade is extensive. Pop. 21,400.

**Cellini** (chel-lē'nē), BENVENU'TO, a sculptor, engraver, and goldsmith, was born at Florence in 1500, and died there in 1571 or 1572. Of a bold, honest, and open character, but vain and quarrelsome, he was often entangled in disputes which frequently cost his antagonists their lives. At the siege of Rome (if we believe his own account, given in his autobiography) he killed the Constable of Bourbon and the Prince of Orange. He was afterwards imprisoned on the charge (probably false) of having stolen the jewels of the papal crown, and with difficulty escaped execution. He then visited the court of Francis I of France. He afterwards returned to Florence, and under the patronage of Cosimo de' Medici produced in bronze a Perseus with the head of Medusa which is still an ornament of one of the public squares; also a statue of Christ, in the chapel of the Pitti Palace, besides many excellent dies for coins and medals. His works may be divided into two classes. The first, for which he is most celebrated, comprises his smaller productions in metal, the embossed decorations of shields, cups, salvers, ornamented sword and dagger hilts, clasps, medals, and coins. The second includes his larger works as a sculptor, such as the *Perseus* mentioned above; a colossal *Mars* for a fountain at Fontainebleau; a marble *Christ* in the Escurial Palace; a life-size statue of *Jupiter* in silver; etc. His life, written by himself, is very racy and animated.

**Cellulares** (sel-lū-la'rēz), in botany, that division of plants which are altogether composed of cellular tissue, without fibers or vessels. They form the greater portion of the acotyledonous or cryptogamic plants.

**Cellular** (sel'ū-lar) THEORY, in physiology, that theory which derives all vegetable and animal tissues from the union and metamorphosis of primitive cells.



Cellular Tissue in Plants.

**Cellular Tissue,** in physiology, a name for what is also called the *areolar tissue* (which see). In botany, the term is applied to the soft substance of plants, composed of elementary vesicles or cells without woody or vascular tissues.

**Celluloid** (sel'ū-loid), an artificial substance extensively used as a substitute for ivory, bone, hard rubber, coral, etc., having a close resemblance to these substances in hardness, elasticity, and texture. It is composed of cellulose or vegetable fibrin reduced by acids to pyroxylin (or guncotton), camphor is then added, and the compound molded by heat and pressure to the desired shape. It is used chiefly for such articles as buttons, handles for knives, forks, and umbrellas, billiard-balls, backs to brushes, piano keys, napkin-rings, opera-glass frames, etc. It can be variously colored.

**Cellulose** (sel'ū-lōs; $C_6H_{10}O_5$), the substance of which the permanent cell-membranes of plants are always composed. It is closely allied to sugar, dextrin, gum, and starch, and is changed into the latter by heat, sulphuric acid, or caustic potash. Cellulose has also been detected in the tunics of ascidia and other invertebrate animals.

**Cellulose Ship Lining,** an application of cellulose to the protection of warships, by preventing the inflow of water through shot-holes. For this purpose the United States in 1892 adopted a preparation called cellulose, made from the fibrous husks of cocoanuts. This is very light and compressible and when tightly packed between the steel plating and the side of the vessel will expand when wet and fill up the space through which a shot may have passed. Another and cheaper product experimented with is the pith of the cornstalk, which is much lighter than the cocoanut fiber and serves the same purpose.

**Celsius** (sel'se-us), the name of a Swedish family, several members of which attained celebrity in science and literature. The best known is ANDERS CELSIUS, born in 1701; died in 1744. After being appointed professor of astronomy at the University of Upsala he traveled in Germany, England, France, and Italy; and in 1736 he took part in the expedition of Maupertuis and others for the purpose of measuring a degree of the meridian in Lapland. He is best known as the constructor of the centigrade thermometer.

**Celsius Scale,** another name for the centigrade thermometric scale, from that of the inventor, Anders Celsius. See *Thermometer.*

**Celsus** (sel'sus), an Epicurean philosopher of the 2d century after

Christ, who is usually said to have been the author of an attack on Christianity entitled *Logos Alēthēs* (True Word), which is now lost, but is mostly preserved in the extracts contained in the more celebrated work *Contra Celsum*, in which it was answered by Origen.

**Celsus,** AURELIUS (or perhaps AULUS) CORNELIUS, a celebrated Latin writer on medicine who lived, probably, under the Roman emperors Augustus and Tiberius, or in the beginning of the Christian era. He also wrote on rhetoric, the art of war, and agriculture. He is, however, best known by his *De Medicina*, long one of the chief manuals on medicine.

**Celtiberi** (sel-ti-bēr'i), or CELTIBERIANS, inhabitants of Celtiberia, now known as Old and New Castile. They originated from Iberians mixed with Celts. After a long resistance to the Romans they were at last subjected to their sovereignty, adopted their manners, language, dress, etc.

**Celtis** (sel'tis), a genus of trees. See *Nettle-tree*.

**Celts** (kelts, selts), the earliest Aryan settlers in Europe according to the common theory. They appear to have been driven westward by succeeding waves of Teutons, Slavonians, and others, but there are no means of fixing the periods at which any of these movements took place. Herodotus mentions them as mixing with the Iberians who dwelt round the river Ebro in Spain. At the beginning of the historic period they were the predominant race in Britain, Ireland, France, Belgium, Switzerland, N. Italy, Spain, and elsewhere. The Romans called them generally Galli, that is Gauls or Gael. They appear to have reached the zenith of their power in the 2d and 3d centuries B.C., when they attacked and temporarily destroyed the growing city of Rome. Some tribes of them, overrunning Greece, settled in a part of Asia Minor, to which the name of Galatia was given. They finally went down before the resistless power of Rome, and either became absorbed with the conquering races or were cooped up in the extreme N. W. of Europe. At an early date the Celts divided into two great branches, speaking dialects widely differing from each other, but doubtless belonging to the same stock. One of these branches is the Gadhelic or Gaelic, represented by the Highlanders of Scotland, the Celtic Irish, and the Manx; the other is the Cymric, represented by the Welsh, the inhabitants of Cornwall, and those of Brittany. The Cornish dialect is now extinct. The sun seems to have been the principal object of worship among the Celts, and groves of oak and the remarkable circles of stone commonly called 'Druidical Circles,' their temples of worship. All the old Celts seem to have possessed a kind of literary order called Bards. The ancient Irish wrote in a rude alphabet called the Ogham (which see); later they employed the Roman alphabet, or the Anglo-Saxon form of it. The chief literature existing consists of the hymns, martyrologies, annals, and laws of Ireland, written from the 9th to the 16th centuries. The Scottish Gaelic literature extant includes a collection of MSS. in the Advocates' Library, Edinburgh, some of which date from the 12th century; the *Book of the Dean of Lismore*, 16th century; a number of songs from the 17th century to the present day; and the so-called poems of Ossian (which see). The Welsh literary remains date from the 9th century, and consist of glossaries, grammars, annals, genealogies, histories, poems, prose tales, etc.

**Celts** (Late Latin *celtis*, a chisel), the name given to certain prehistoric weapons or other implements of stone or bronze which have been found over nearly the whole surface of the earth. Stone celts are found in the form of hatchets, adzes, chisels, etc. In size they vary, some being found only about 1 inch in length, and others approaching 2 feet; but the most common length is from 6 to 8 inches, and the breadth is usually about ½ or ⅛ of the length. The materials of which they are made are flint, chert, clay-slate, porphyry, various kinds of greenstone and of metamorphic rocks, and, in short, any very hard and durable stone. Bronze celts belong to a later period than stone ones, and are not so numerous. Some stone celts, however, have been found along with bronze celts in such a manner as to show that stone celts were still used when the method of working bronze had been discovered, a circumstance that need not be wondered at. Bronze celts are not found so large as the largest stone celts, the largest bronze celt being under one foot; but the average size of a

Bronze Celts.

Bronze Celt.

bronze celt is about the same as that of a stone, namely about 6 inches.

**Cembra Pine** (sem'bra; *Pinus Cembra*), a fine conifer of Central Europe and Siberia, having edible seeds and yielding a turpentine called Carpathian balsam. Swiss stone pine and Siberian pine are also names given to it.

**Cementation** (se-men-tā'shun), the conversion of iron into steel by heating the iron in a mass of ground charcoal, and thus causing it to absorb a certain quantity of the charcoal.

**Cements** (se-ments'), the general name for glutinous or other substances capable of uniting bodies in close cohesion. In building the name is given to a stronger kind of mortar than that which is ordinarily used, consisting of those hydraulic limes which contain silica and therefore set quickly. Cements are variously composed, according to the nature of the surfaces to which they are applied and their exposure to heat or moisture. *Hydraulic* or *water cements* harden under water and consolidate almost immediately on being mixed. Of this kind are the Roman and Portland cements. Natural cement develops only about half the strength, and has less sand-carrying power than Portland.

**Cenci** (chen'chē), BEATRICE, called the *beautiful parricide*, the daughter of Francesco Cenci, a noble and wealthy Roman (1527–98), who, according to the common story, after his second marriage behaved towards the children of his first marriage in the most shocking manner, procured the assassination of two of his sons, on their return from Spain, and debauched his youngest daughter Beatrice. She failed in an appeal for protection to the pope, and planned and executed the murder of her father. She was beheaded in 1599 and the Cenci estates were confiscated. She is the alleged subject of an admired painting by Guido, and is the heroine of one of Shelley's most powerful plays. Recent researches have deprived the story of most of its romantic elements, and have shown Beatrice to be a very commonplace criminal, whatever the evil deeds of her father may have been. Her stepmother and brother, who were equally guilty with her, were also executed. The portrait by Guido is now believed not to represent her at all.

**Cenis** (sē-nē'), MOUNT, a mountain belonging to the Graian Alps, between Savoy and Piedmont, 11,755 feet high. It is famous for the winding road constructed by Napoleon I, which leads over it from France to Italy, and for an immense railway tunnel, which, after nearly fourteen years' labor, was finished in 1871. The tunnel does not actually pass through the mountain, but through the Col de Fréjus, about 15 miles to the S. W., where it was found possible to construct it at a lower level. The Mount Cenis Pass is 6765 feet above the level of the sea, whereas the elevation of the entrance to the tunnel on the side of Savoy is only 3801 feet, and that on the side of Piedmont 4246 feet. The total length of the tunnel is 12,849 meters (42,145 feet, or nearly 8 miles). The total cost amounted to $13,000,000, which was borne partly by the French and Italian governments and partly by the Northern Railway Company of Italy. The tunnel superseded a grip railway which was constructed over the mountain by Mr. Fell, an English engineer, 1864–68.

**Cenobite** (sē'nō-bīt), one of a religious order living in a convent or in community; in opposition to an anchorite or hermit, who lives in solitude.

**Cenotaph** (sen'ō-taf), a monument erected in honor of a deceased person, but not containing his body, as is implied from the derivation (Gr. *kenos*, empty, and *taphos* a tomb).

**Censer** (sen'sėr), a vase or pan in which incense is burned; a vessel for burning and wafting incense. Among the ancient Jews the censer was used to offer perfumes in sacrifices. Censers, called also thuribles, are still used in the Roman Catholic Church at mass, vespers, and other offices, as well as in some Anglican and other churches. They are of various forms. In Shakespere's time the term was applied to a bottle perforated and ornamented at the top, used for sprinkling perfume, or to a pan for burning any odoriferous substance.

**Censors** (sen'sorz), two officers in ancient Rome who each held office for eighteen months, and whose business was to draw up a register of the citizens and the amount of their property, for the purposes of taxation; to keep watch over the morals of the citizens, for which purpose they had power to censure vice and immorality by inflicting a public mark of ignominy on the offender; and to superintend the financial administration and the keeping up of public buildings. The office was the highest in the state next to the dictatorship, and was invested with a kind of sacred character. The term is now applied to an

officer empowered to examine books before publication. See *Books, Censorship of.*

**Census** (sen'sus), with the Romans a registered statement of the particulars of a person's property for taxation purposes; an enumeration and register of the Roman citizens and their property, introduced by King Servius Tullius B.C. 577. In modern times a census is an enumeration of the inhabitants of a country, accompanied by any other information that may be deemed useful. In most civilized countries such enumerations now take place at fixed intervals. The first authentic census in France appears to have been that of 1700; since 1822 it has been taken every five years. The first census in Russia was taken by order of Peter the Great in 1723, and it was decreed that it should be repeated every twenty years. It now takes place more frequently. In Prussia the practice of taking a census of the population dates from the time of Frederick the Great. Even before the formation of the new German Empire all the principal states of Germany had united for purposes of enumeration, and a census was taken every three years. The first census of the new German Empire was taken in 1871, since when there has been a census every five years. The first census of the United States took place in 1790, the first of Great Britain in 1801, of Ireland in 1811, and of the British empire in 1871. Aside from Germany, it is common to take a census every ten years.

**Cent,** CENTIME (sent; sän-tēm), etc., the name of a small coin in various countries, so called as being equal to a hundredth part of some other coin. In the United States and in Canada the cent is the hundredth part of a dollar. In France the *centime* is the hundredth part of a franc. Similar coins are the *centavo* of Chile; and the *centesimo* of Italy, Peru, etc. Cents or centimes, and their equivalents, are written simply as decimals of the unit of value. The first United States cent, authorized by act of congress, April 22, 1792, was of copper, weighing 264 grains; reduced in 1793 to 208 grains, in 1796 to 168 grains; discontinued in 1857. The nickel cent, weighing 72 grains, composed of 88 per cent copper and 12 per cent nickel, authorized in 1857, was discontinued in 1864. The bronze cent, weight 48 grains, composed of 95 per cent copper and 5 per cent of tin and zinc, was authorized in 1864.

**Centaurea** (sen-tą're-a), a very extensive genus of herbaceous plants, nat. order Compositæ; of no importance.

**Centaurs** (sen'tąrs), in Greek myth. fabulous beings represented as half man, half horse. The earliest notices of them, however, merely represent them as a race of wild and savage men inhabiting the mountains and forests of Thessaly. Mythology relates the combats of the Centaurs with Hercules, Theseus and Pirithoüs. The Centaurs Nessus, Chiron, and others are famous in ancient fable.

Centaur.—Antique statue in Vatican Museum.

**Centaurus** (sen-tą'-rus), a constellation of the southern hemisphere, near the south pole, E. and N. of the Southern Cross.

**Centaury** (sen-tą'ri), the *Erythræa Centaurium*, an annual herb of the gentian family with pretty red flowers. It is common throughout Europe, and is extolled for its medicinal properties by the old herbalists. It is common in England, especially on dry, sandy, or chalky soils.

**Centavo** (sen-ta'vō). See *Cent.*

**Centenary** (sen'te-na-ri), the commemoration of any event, as the birth of a great man, which occurred 100 years before.

**Centennial Exposition,** a World's Fair held at Philadelphia in 1876, in commemoration of the hundredth anniversary of the signing of the Declaration of Independence. It was the first international fair held in America and every effort was put forth to make it notable. A large space was set aside in Fairmount Park and many buildings, small and large, were erected, the Main Exhibition Building covering a space of 21.27 acres. It was 1800 feet long and 404 feet wide. The various nations made imposing exhibitions of their products, and taught the Americans useful lessons in the field of art, while the Americans had equal lessons for them in the field of machinery. A notable event was the exhibit of the telephone, then first shown. The number of visitors during the six months of the exposition was 9,910,966, the greatest

number on one day being 274,919. Two of the buildings were left as permanent acquisitions of Philadelphia: Memorial Hall, which has now a large collection of industrial art objects, and Horticultural Hall, equally filled with exotic plants.

**Centerboard,** a sort of movable keel used especially in American yachts, and capable of being raised and lowered in a well extending longitudinally amidships. It tends to prevent leeway and gives the vessel greater stability when under a press of canvas.

**Center of Gravity,** the point of a body through which the line of the resultant of the weights of all the particles composing the body always passes, whatever be the position of the body.

**Center of Gyration,** the point at which if the whole mass of a revolving body were collected, the rotatory effect would remain unaltered.

**Center of Oscillation,** that point of a body suspended by an axis at which, if all the matter were concentrated, the oscillations would be performed in the same time.

**Center of Pressure,** that point of a body at which the whole amount of pressure may be applied with the same effect as it would produce if distributed; specifically, in hydrostatics, that point in the side of a vessel containing a liquid to which, if a force were applied equal to the total pressure and in the opposite direction, it would exactly balance the effort of the total pressure.

**Centering** (sen'tėr-ing), the framing of timber by which the arch of a bridge or other arched structure is supported during its erection. The same name is given to the woodwork or framing on which any vaulted work is constructed. The centering of a bridge has to keep the stones or *voussoirs* in position till they are keyed in, that is, fixed by the insertion of the requisite number of stones in the center.

**Centerville** (sen'tėr-vil), a city, capital of Appanoose Co., Iowa, 30 miles S. W. of Ottumwa. Manufacturing is an important industry, and coal is extensively mined, while there are iron, brick and other industries. Pop. 6968.

**Centiare** (sân-tyär), a French measure, the hundredth part of an *are;* a square meter, equal to 1.19 square yards.

**Centigrade.** See *Thermometer.*

**Centime.** See *Cent.*

**Centipede** (sen'ti-pēd), a term applied to various insect-like creatures having many feet, and a body consisting of numerous similar rings or segments (*somites*), all belonging to the order Cheilopoda, class Myriapoda.

Centipede (*Scolopendra*).

The common centipede, found in the United States, is quite harmless, but those of tropical countries belonging to the genus *Scolopendra* inflict severe and often dangerous bites. They sometimes grow to a foot in length.

**Centlivre** (sent-lē'vėr), SUSANNA, a dramatic writer, daughter of a Lincolnshire gentleman named Freeman, was born in Ireland about 1667; died 1723. After being twice left a widow within a short time of her marriage she took for a third husband Joseph Centlivre, chief cook to Queen Anne. She had some success as an actress, but her fame rests on *The Busybody, The Wonder, A Bold Stroke for a Wife,* and 14 other plays, all of which were published in a collected edition, 1761. Mrs. Centlivre enjoyed the friendship of Steele, Farquhar, Rowe, and other wits of the day.

**Centner** (sent'nėr), a common name on the continent of Europe for a hundredweight. In Switzerland it is equal to 110 lbs.; in Austria, 110¼; in Sweden, 112.06; in Germany 110.25.

**Cento** (sen'tō; L., a patchwork), a poem formed out of verses taken from one or more poets, so arranged as to form a distinct poem.

**Centorbi.** See *Centuripe.*

**Central America,** a geographical division comprising the states in that portion of the American continent between Mexico in the north and Colombia in the south. It includes the six republics of Costa Rica, Nicaragua, Salvador, Honduras, Gautemala, and Panama, and the British colony of Honduras. On either side are the Caribbean Sea and the Pacific Ocean. Its entire area is about 181,500 sq. miles. It is generally mountainous, contains a number of active volcanoes and is a rich but little

developed region. A Central American Court of Justice was set up in 1907. A Central American Conference was established in 1909 at which agreements have been made regarding uniform monetary, metric, consular, postal and fiscal systems.

**Central Falls,** a city of Providence Co., Rhode Island, 4½ miles N. of Providence. There is a variety of manufactures, including glass, hosiery, lace, thread, yarn, cotton goods, machinery, leather, paper boxes, etc. Pop. 24,000.

**Central Forces,** the forces which cause a moving body on which they act to tend towards or recede from the center of motion, or that point which remains at rest while all the other parts of a body move round it. The force with which the revolving body tends to fly from the center is called the *centrifugal force*, and the force which causes it to tend towards the center of motion is called the *centripetal force*.

**Centralia** (sen-trā'li-a), a city of Marion Co., Illinois, 60 miles E. by S. of St. Louis. Has numerous industries, and is a shipping point for large quantities of fruit; also a coal mining center. Pop. 9680.

**Centralization** (sen-tral-i-zā'shun), a term in a specific sense applied to a system of government where the tendency is to administer by the central government matters which had been previously, or might very well be, under the management of local authorities.

**Central Provinces and Berar,** an extensive British territory in India, which was formed in October, 1903, by the amalgamation of the Central Provinces and the Hyderabad Assigned Districts. The total area of the provinces is 113,281 sq. miles, and the population of that area in 1901 was 10,847,325. The province consists of the five British divisions of Jubbulpore, Nerbudda, Nagpur, Chatisgarh, and Berar. The administration is in the hands of a chief commissioner on behalf of the governor-general of India. Agriculture is in an active state, wheat, rice, and cotton being grown. The chief industries are cotton and coal.

**Centrifugal and Centripetal** (sen-trif'ū-gal, sen-trip'e-tal), in botany, terms applied to two kinds of inflorescence, the former being that in which the terminal or central flower is the first to expand, as in a true cyme (examples, elder and valerian), the latter being that kind in which the lower or outer flower is the first to expand, as in spikes, racemes, umbels, and corymbs. The laburnum, hemlock, and daisy are examples.

**Centrifugal and Centripetal Force.** See *Central Forces.*

**Centurion** (sen-tūr'i-on), in the ancient Roman army, the commander of a century, or body of 100 men, but afterwards an indefinite number, the sixtieth part of a legion. The rank of a centurion corresponded pretty much to that of a captain in modern armies.

**Centuripe** (chen-tū'ri-pā; anc. *Centuripa*), also called *Centorbi*, a town of Sicily, prov. Catania, situated in a fertile district yielding soda, sulphur, and marble. The ancient city, of which considerable remains exist (antique coins, gems and vases being abundantly found), was one of the most flourishing of Sicily. Pop. 10,898.

**Century** (sen'tū-ri; Latin *centuria*, from *centum*, a hundred), one of the divisions or companies into which the Roman legions were divided, originally 100 men. This name was also given to the divisions of the six classes of the people introduced by Servius Tullius. According to Livy, the first class contained eighty-two, to which were added the eighteen centuries of the knights; the three following classes had each twenty centuries; the fifth, thirty-four; and the sixth only one century. From this usage it has been applied to indicate a period of one hundred years, in which sense it is now alone used.

**Century-plant,** a popular name of the *Agāve Americāna*, or American aloe, arising from the erroneous idea that it blooms only once in a century.

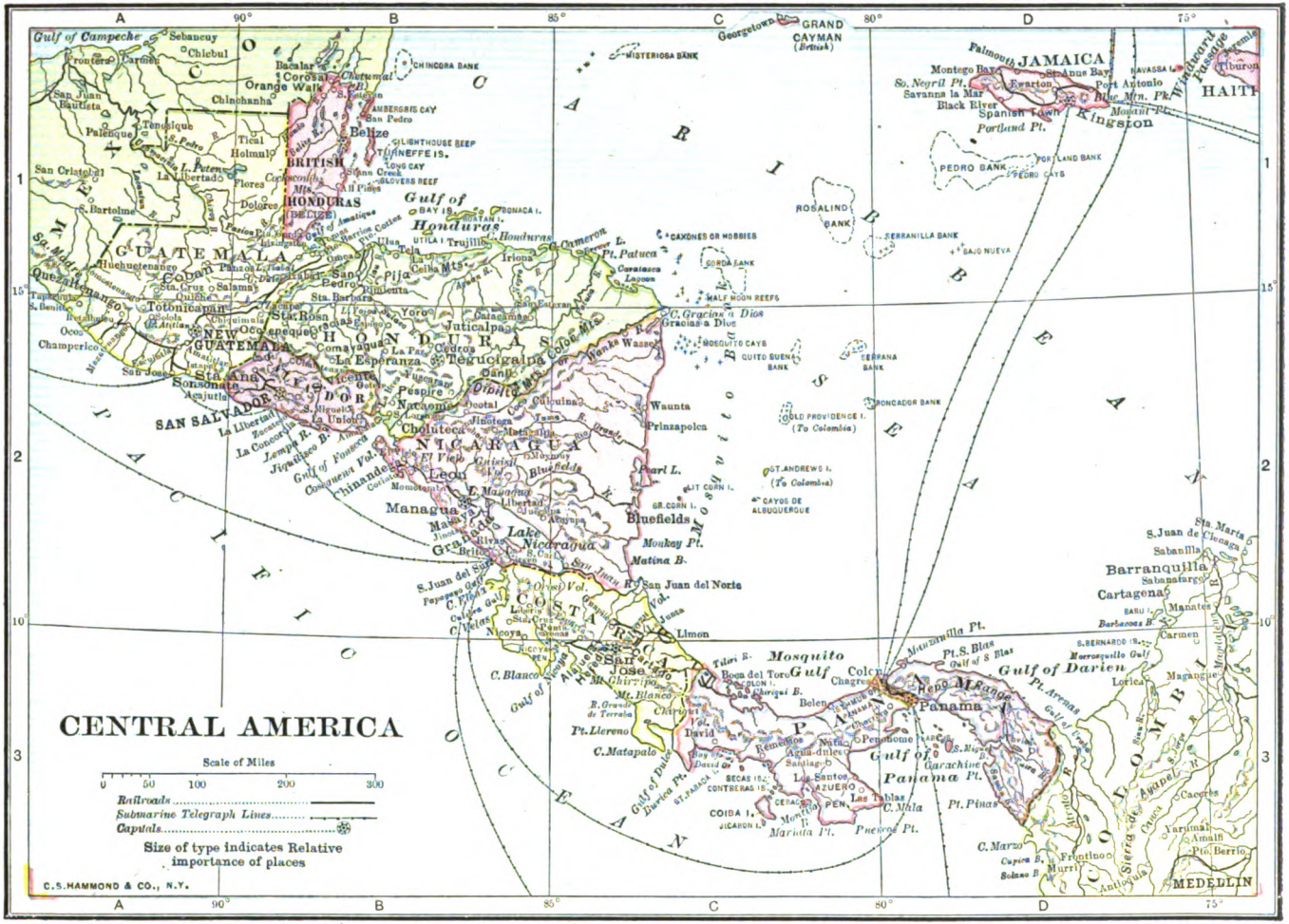
**Ceos.** See *Zea.*

**Cephaëlis.** See *Ipecacuanha.*

**Cephalaspis** (se-fal-as'pis; Gr. *kephalē*, the head, and *aspis*, a shield), a genus of fossil ganoid

Cephalaspis Lyellii.

fishes occurring in the Old Red Sandstone, belonging to the same order as the bony-pike and sturgeon. They have longish bodies; the head is large and


CENTRAL AMERICA
Scale of Miles
0 50 100 200 300
Railroads
Submarine Telegraph Lines
Capitals
Size of type indicates Relative importance of places
C.S.HAMMOND & CO., N.Y.
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
PANAMA
SAN SALVADOR
JAMAICA
HAITI
COLOMBIA
CARIBBEAN SEA
PACIFIC OCEAN
Gulf of Honduras
Mosquito Gulf
Gulf of Darien
Gulf of Panama
Lake Nicaragua
Belize
Managua
Bluefields
Limon
Colon
Panama
Kingston
Barranquilla
Cartagena
MEDELLIN

crescent-shaped, bearing a close resemblance to the shape of a saddler's knife, and is protected by a large buckler-shaped plate which is prolonged into a point on either side.

**Cephalization** (se-fal-i-zā'shun), in biol. a term proposed to denote a tendency in the development of animals towards a localization of important parts in the neighborhood of the head, as by the transfer of locomotive members or limbs to the head (in the Cephalopoda, for example). The term is also used to indicate the degree in which the brain dominates over the other parts of the animal structure.

**Cephalonia** (se-fal-ō'ni-a; ancient *Kephallenia*), an island of Greece, the largest of the Ionian Islands, w. of the Morea, at the entrance of the Gulf of Patras, about 31 miles in length, and from 5 to 12 in breadth; area, about 260 square miles; pop. 71,235. The coastline is very irregular and deeply marked with indentations, and the surface is rugged and mountainous, rising in Monte Negro, the ancient Ænos, to a height of 5380 feet. There is rather a deficiency of water on the island. The principal towns are Argostoli and Lixuri. The chief exports are currants, oil, and grain; wine, cheese, etc., are also exported. The manufactures are inconsiderable. Earthquakes are not infrequent. One of the most destructive was that of the year 1867. See *Ionian Islands*.

**Cephalopoda** (sef-a-lop'o-da), CEPH'ALOPODS (Gr. *kephalē, head; pous, podos,* foot), a class of the mollusca, the highest in organization in that division of the animal kingdom, characterized by having the organs of prehension and locomotion, called tentacles or arms, attached to the head. The arms are furnished with numerous suckers, and enable them to cling to and entangle their prey; and they have a pair of well-developed jaws and eyes. They are divided into two sections, Tetrabranchiata (four-gilled) and Dibranchiata (two-gilled). The nautilus and the fossil genera *Orthoceras, Ammonites, Goniatites,* etc., belong to the Tetrabranchiata, in which the animal has an external shell. The dibranchiate group includes the argonaut, the octopus or eight-armed cuttlefishes, and the ten-armed forms, as the calamaries, the fossil belemnites, etc. The shell is in all these internal (being known as the 'pen' and the 'cuttle-bone') in some rudimentary. The fossil Cephalopoda are multitudinous. See *Argonaut, Calamary, Nautilus, Sepia,* etc.

**Cephaloptera** (sef-al-op'tėr-a; Gr. *kephalē,* head; *pteron,* a wing), a genus of cartilaginous fishes of the ray family, having a pair of little fins which stand out from the head like horns; hence called fin-headed rays or horned rays. Only one species (*C. Giorna*) has been found near the British coasts.

**Cephalothorax** (sef-a-lō-thor'aks), the anterior segment in spiders, scorpions, crustaceans, etc., consisting of the head and thorax combined.

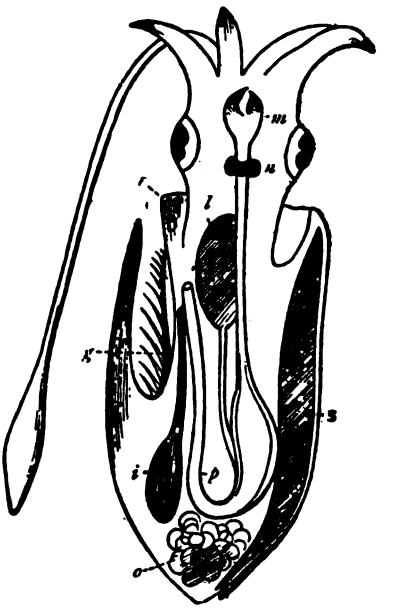



DIAGRAM OF A CUTTLE-FISH.

*m*, Mandibles; *n*, cerebral ganglia; *l*, liver; *p*, intestine; *o*, ovary; *g*, gill; *i*, ink-bag; *f*, funnel; *s*, internal skeleton, or 'cuttle-bone.'

**Cepheus** (sē'fūs), a fabled king of Ethiopia and husband of Cassiopeia; his name was given to a constellation of stars in the northern hemisphere surrounded by Cassiopeia, Ursa Major, Draco, and Cygnus.

**Ceram** (sē-ram'), an island in the Moluccas, lying west of New Guinea; area about 7000 sq. miles; pop. estimated at less than 100,000. It is about 200 miles long with an average width of 35 miles. Its interior is traversed by mountain ranges from 6000 to 8000 feet high, but is little known. The

vegetation is luxuriant, the sago-palm supplying the chief food of the inhabitants as well as an article of trade. Clove and nutmeg trees grow wild, and magnificent trees abound in the forests. The coast people are bold fishers and navigators. The inhabitants of the coast are of Malay origin, the interior being peopled by Alfoories. It is held by the Netherlands.

**Ceramiaceæ** (se-ram-i-ā'se-ē), a natural order of cellular seaweeds (Algæ), consisting of thread-like, jointed plants of a red or brown-red color. The spores are in masses in transparent membranous sacs, and the tetraspores are external. The *Chondrus crispus*, or carrageen moss; the *Rhodomenia palmāta*, or dulse; and the *Plocaria tenax*, extensively used by the Chinese as a glue and varnish, belong to this order.

**Ceramic Art** (se-ram'ik; ke-ram'ik), that department of plastic art which comprises all objects made of baked clay, as vases, cups, urns, bassi-rilievi, statuettes, etc., and including all the varieties of earthenware and porcelain which can be regarded as works of art.

**Cerastes** (ser-as'tēz; Gr., from *keras*, a horn), a genus of African vipers, remarkable for their fatal venom, and for two little horns formed by the

**Cerastes vulgaris.**

scales above the eyes. Hence they have received the name of horned vipers. The tail is very distinct from the body. *C. vulgāris* is the horned viper of Northern Africa, a species known to the ancients. There are several other species.

**Cerasus** (ser'a-sus), the cherry genus of trees.

**Cerate** (sē'rāt), the name of an external medicament, more or less liquid, having for its basis wax and oil. Simple cerate consists of 8 oz. of lard and 4 of white wax melted together and stirred till cold.

**Ceratodus** (se-rat'ō-dus), a genus of fishes belonging to the Dipnoi or lung-fishes. It is the barramunda or native salmon of the Australian rivers, measures from 3 to 6 feet in length, and forms an interesting connecting link between the oldest surviving group of fishes and the lowest air-breathing animals. It is said to leave the water and go on the flats after vegetable food, but its traveling powers cannot be great.

**Cerberus** (sėr'bėr-us), in classical mythology, the dog-monster of Hades, variously described as having a hundred, fifty, and three heads, with a serpent's tail, and a mane consisting of the heads of various snakes. It was subdued by Heracles (Hercules).

Cerberus—antique bronze.

**Cercaria** (sėr-kā'ri-a), a name formerly given to a supposed genus of Entozoa, at first mistaken for Infusoria, but now known to be the second larval stage of a trematode worm or fluke. It is a tadpole-like body, which becomes encysted, and gives rise to the sexual forms.

**Cercis.** See *Judas Tree.*

**Cercopithecus** (sėr-ko-pi-thē'kus), a genus of monkeys, one of them being the Diana monkey (*C. Diana*) another the Mona monkey (*C. Mona*).

**Cerdic** (ker'dik), king of the West Saxons, who invaded England about the end of the 5th century, and established the kingdom of Wessex about 516. At his death in 534 his kingdom included the present counties of Berks, Wilts, Dorset, and Hants (including the Isle of Wight).

**Cere** (sēr), the naked skin that covers the base of the bill in some birds, and which is supposed to exercise a tactile sense.

**Cerealia.** See *Ceres.*

**Cereals** (sē'rē-alz), a term derived from Ceres, the goddess of corn. Though sometimes extended to leguminous plants, as beans, lentils, etc., it is more usually and properly confined to the Gramineæ, as wheat, barley, rye, oats, and other grasses, cultivated for the sake of their seed as food.

**Cerebration** (sėr-e-brā'shun), exertion or action of the brain, conscious or unconscious.

**Cerebro-spinal** (ser-e-brō-spī'nal), pertaining to the

brain and spinal cord together, looked on as forming one nerve mass.

**Cerebrum and Cerebellum.** See *Brain.*

**Cereopsis** (sēr-e-op'sis), a genus of birds allied to the geese, the only species being *C. Novæ Hollandiæ*, called New Holland or Australian goose.

**Ceres** (sē'rēz), a Roman goddess, corresponding to the Greek Dēmētēr; she was the daughter of Kronos and Rhea, and the mother of Proserpine and Bacchus. She was the goddess of the earth in its capacity of bringing forth fruits, especially watching over the growth of grain and other plants. The Romans celebrated in her honor the festival of the Cerealia. Ceres was always represented in full attire, her attributes being ears of corn and poppies, and her sacrifices consisted of pigs and cows.— Also a planet discovered by M. Piazzi at Palermo, in Sicily, in 1801. It was the first discovered of the asteroids. Its size is less than that of the moon.

**Cereus** (sē'rē-us), a genus of cactuses, natives of tropical America, with large funnel-shaped flowers. Many are night-flowering plants, like *C. grandiflōra* of the W. Indies, well known in hothouses as the night-blooming Cereus.

**Ceriama.** See *Seriema.*

**Cerignola** (cher-ē-nyō'lȧ), a town of South Italy, in the province of and 24 miles S. E. from Foggia. It has linen manufactures and a trade in almonds, cotton, etc. Pop. of commune 34,195.

**Cerigo** (cher-ē'gō; anc. *Cythēra*), a Greek island in the Mediterranean, south of the Morea, from which it is separated by a narrow strait; area about 100 sq. miles. It is mountainous and barren, though some of the valleys are fertile, producing corn, wine, and olives. Excellent honey is produced. Sheep, hares, and quails are abundant. Pop. about 15,000. The island is usually known by its ancient name *Cythera.* It is the see of a Greek bishop.

**Cerinthus** (sēr-in'thus), the founder of a heretical sect of the first century whose doctrines were a mixture of Judaism and Gnosticism, and against whom the Gospel of John was supposed to have been written.

**Cerite.** See *Cerium.*

**Cerithium** (sēr-ith'i-um), the typical genus of a family of gasteropodous molluscs, containing numerous species, both marine and fresh-water, and having spiral, elongated, and many-whorled shells.

**Cerium** (sē'ri-um), a rare metal, discovered in 1826, in a Swedish mineral known by the name of *cerite.* It exists also in a few other minerals. It is obtained as a powder in small quantities.

**Ceroplastic Art** (sēr-ō-plas't i k), the art of modelling in wax.

**Ceroxylon** (sēr-oks'i-lon), a genus of South American palms; the wax-palm.

**Cerreto** (cher-rā'tō), a town in South Italy, province of Benevento, on the slope of Mount Matese, a pleasant town with a handsome cathedral. Pop. 5343.

**Cerro de Pasco** (ser'rō dā päs'kō), a town of Peru, capital of the department of Junin, 14,275 feet above the level of the sea. The town came into existence in 1630, in consequence of the discovery of veins of silver there. The climate is trying and the whole place uninviting, though it still contains the most productive of the Peruvian mines. Pop. about 14,000.

**Certaldo** (cher-tȧl'dō), a small town of North Italy, 15 miles S. W. from Florence. It is the birthplace, was long the home, and now contains the ashes of Boccaccio, and many interesting relics. Pop. 4552.

**Certhia** (sēr'thi-a), a genus of insessorial birds, type of the family Certhiadæ or Creepers. See *Creepers.*

**Certiorari** (sēr-she-ō-rā'rī), in law, a writ issuing out of a superior court to call up the records of an inferior court or remove a cause there depending, that it may be tried in the superior court. This writ is obtained upon the complaint of a party that he has not received justice, or that he cannot have an impartial trial in the inferior court.

**Certosa di Pavia** (cher-tō'sȧ), a celebrated Italian monastery near Pavia, founded in 1396 by Galeazzo Visconti, Duke of Milan. The church is a splendid building.

**Ceruleum** (se-rō'le-um), a blue pigment, consisting of stannate and protoxide of cobalt mixed with stannic acid and sulphate of lime.

**Ceruminous Glands** (s e-r ō'm i n-u s), the glands of the ear which secrete the cerumen or wax which lubricates the passage to the tympanum and prevents the entrance of foreign matter.

**Ceruse** (sē'rus), white lead, carbonate of lead produced by exposing the metal in thin plates to the vapor of acetic acid or vinegar. It is much used in painting, and a cosmetic is made from it.

**Cerusite** (sē'rų-sit), a native carbonate of lead, next to galena the most abundant ore of lead. Its specific gravity is 6.4 to 6.6. When heated it decrepitates, and is converted into oxide of lead.

**Cervantes Saavedra** (ther-vän'tes sä-ä-vā'drä), MIGUEL DE, author of *Don Quixote*, born at Alcalá de Henares in 1547, and removed thence to Madrid at the age of seven. He commenced writing verses at an early age, and his pastoral *Filena* attracted the notice of Cardinal Acquaviva, whom he accompanied to Italy as page. In 1570 he served under Colonna in the war against the Turks and African corsairs, and in the battle of Lepanto (1571) lost the use of his left hand. After this he joined the troops at Naples, in the service of the Spanish king, winning the highest reputation as a soldier. In 1575, while returning to his country, he was taken by the corsair Arnaut Mami, and sold in Algiers as a slave—a condition in which he remained for five years, displaying great fortitude. In 1580 his friends and relations at length ransomed him, and, rejoining his old regiment, he fought in the naval battle and subsequent storming of Terceira. In 1583, however, he retired from service, and recommenced his literary work, publishing in 1584 his pastoral *Galatea*. In the same year he married, and lived for a long time by writing for the stage, to which he contributed between twenty and thirty plays, of which two only have survived. From 1588 to 1599 he lived retired at Seville, where he held a small office. He did not appear again as an author till 1605, when he produced the first part of *Don Quixote*, a work having, as its immediate aim, the satirical treatment of the novels of chivalry then popular, but embodying at the same time human types of cosmopolitan interest, and having a profounder bearing upon life than its express object covered. In 1613 his twelve *Exemplary Novels* (his best work after *Don Quixote*), in 1614 his *Journey to Parnassus*, and in 1615 eight new dramas, with intermezzos, were published. In 1614 an unknown writer published, under the name of Alonzo Fernandez de Avellaneda, a continuation of *Don Quixote*, full of abuse of Cervantes, who thereupon published the real continuation, which was the last work of his issued during his lifetime. His novel *Persiles and Sigismunda* was published after his death, which took place at Madrid on the same day as that of Shakespere, April 23, 1616.

**Cervetri** (cher-vā'trē), a small place in Italy, prov. Rome, where formerly stood the ancient Etruscan city of Cære. It has yielded many artistic and other objects of Etruscan manufacture.

**Cervidæ.** See *Cervus*.

**Cervin** (ser-van), MONT (German, *Matterhorn;* Italian, *Monte Silvio*), a mountain of Switzerland, Pennine Alps, on the S. frontiers of canton Valais, about 6 miles W. S. W. of Zermatt. It is an almost inaccessible obelisk of rock, starting up from an immense glacier to a height of 14,837 feet. The peak was first ascended by a party of four English travelers and three guides in July, 1865, but three of the party and a guide perished in the descent.

**Cervus** (ser'vus), the genus of animals to which the stag belongs, forming the type of the deer family, Cervidæ.

**Cesarotti** (che-sä-rot'tē), MELCHIORE, one of the most celebrated of the Italian *literati* of the 18th century, born at Padua in 1730, where he became professor of rhetoric, and subsequently professor of the Greek and Hebrew languages. Besides his own poems, his works include translations of Voltaire's tragedies, Ossian, Demosthenes, and the *Iliad*, and essays on the *Philosophy of Languages*, on *Studies*, etc. He died in 1808.

**Cesena** (che-sā'nä), a town of Central Italy, province of Forli, on the right bank of the Savio, at the foot of a mountain. It has a handsome town-house, a cathedral, and some silk-mills. Pop. 12,245.

**Cesnola** (ches-nō'la), COUNT LUIGI PALMA DI, an Italian-American soldier and archæologist, born near Turin, Italy, 1832, served in the war against Austria (1848–9) and in the Crimean war, came to the United States in 1860, and was a distinguished officer in the Civil war. In 1865 he was made brigadier-general and consul to Cyprus, where he spent ten years collecting Greek antiques. These, of great antiquarian value, were bought in 1873 by the N. Y. Metropolitan Museum of Art, of which he was appointed director and trustee in 1878, remaining till his death in 1904.

**Cespedes** (thes'pe-*des*), PABLO DE, a Spanish painter, sculptor, architect, poet, and man of letters, born

at Cordova in 1538, entered the University of Alcalá de Henares in 1556, and finally went to Rome, where he studied under Zucchero and Michel Angelo, and became renowned both for frescoes and sculptures. In 1577 he obtained a prebend in the cathedral of Cordova, and from that time resided alternately in his native town and in Seville. He died in 1608. His best pictures are in Cordova, Seville, Madrid, and several towns of Andalusia.

**Cestoidea** (ses-toi'de-a), CESTOID WORMS, a name for the Tæniadæ, or tapeworms.

**Cestracion** (ses-trā'si-on), a genus of cartilaginous fishes allied to the sharks, of which the best-known species is the Port Jackson shark of Australia (*C. Philippi*).

**Cestus** (ses'tus), in classical mythology, a girdle worn by Aphroditē or Venus, endowed with the power of exciting love towards the wearer.

**Cestus,** a leathern thong or bandage, often covered with knots and loaded with lead and iron, anciently

Various Forms of Cestus.

worn by Roman pugilists to increase the force of the blow.

**Cetacea** (sē-tā'sē-a), an order of marine animals, surpassing in size all other animals in existence. They are true mammals, since they suckle their young, have warm blood, and respire by means of lungs, for which purpose they come to the surface of the water to take in fresh supplies of air. The body is fishlike in form, but ends in a bilobate tail, which is placed horizontally, not, as in the fishes, vertically. The posterior limbs are wanting, and the anterior are converted into broad paddles or flippers, consisting of a continuous sheath of the thick integument, within which are present representatives of all the bones usually found in the forelimb of mammals. The fishlike aspect is further increased by the presence of a dorsal fin, but this is a simple fold of integument, and does not contain bony spines. The right whale and its allies have no teeth in the adult state, their place being taken by triangular plates of *baleen* or whalebone which are developed on transverse ridges of the palate, but the fœtal whales possess minute teeth, which are very soon lost. The nostrils open directly upwards on the top of the head, and are closed by valvular folds of integument which are under the control of the animal. When it comes to the surface to breathe it expels the air violently (popularly known as 'blowing' or 'spouting'), and the vapor it contains becomes condensed into a cloud, which resembles a column of water and spray. The blood-vessels in these animals break up into extensive plexuses or networks, in which a large amount of oxygenated blood is delayed, and they are thus enabled to remain a considerable time under water. Injury to these dilated vessels leads to profuse hemorrhage, and hence the whale is killed by the comparatively trifling wound of the harpoon. The Cetacea (which are grouped broadly as Mysticeti or toothless whales; and Odontoceti, Denticeti, or toothed whales) are commonly divided into five families: (1) *Balænidæ*, or whalebone whales, divided into two sections: smooth whales, with smooth skin and no dorsal fin, and furrowed whales, with furrowed skin and a dorsal fin; (2) *Physeteridæ*, *Catodontidæ*, sperm-whales or cachalots, the palates of which have no baleen-plates, and which are furnished with teeth, developed in the lower jaw only; (3) in both jaws, and including the dolphins, porpoises, and narwhal; (4) *Rhynchoceti*, a family allied to the sperm-whales, but having only a pair or two pairs of teeth in the lower jaw, a pointed snout or beak, a single blow-hole, etc.; (5) *Zeuglodontidæ*, an extinct family, distinguished from all the tooth-bearing whales by the possession of molar teeth implanted by two distinct fangs, etc. The last family is exclusively confined to the Eocene, Miocene, and Pliocene periods. The *Sirenia*, or manatees and dugongs, have sometimes been classified among the Cetacea, but they must be regarded as forming a separate order.

**Ceterach** (set'ĕr-ak), a genus of ferns, suborder Polypodiaceæ, chiefly known by the reticulated veins, the simple sori, with scarcely any indusium, and the abundance of chaffy scales which clothe the under surface of the leaf. One species, *C. officinārum* (the scale-fern or miltwaste), is indigenous to Britain, and common on rocks and walls.

**Cetewayo** (kech-wā'ō), a Kaffir chief or king, son of Panda,

king of the Zulus. He was recognized as king by the Natal government in 1873, in preference to other claimants, but disputes arising in regard to boundaries, he declared war against the British in 1879. He was defeated and taken prisoner, but in 1882 was conditionally restored to part of his dominions. In the following year he was driven from power by the chief Usibepu, and remained under the protection of the British until his death in 1884.

**Cetinje.** See *Cettigné.*

**Cetiosaurus** (sē-ti-ō-są'rus), CETEOSAURUS, the whale-lizard, a genus of fossil saurians, the most gigantic of the order Deinosauria. The articulations of the bones of the limbs, the possession of long claws, and the hollowness of the bones indicate that it was a terrestrial animal, probably an inhabitant of marshes or river-sides. Their remains are found in the Oolite and Wealden formations.

**Cette** (set), a fortified seaport, France, dep. Hérault, upon a peninsula between the Mediterranean and Lake Thau, into which the great canal of Languedoc enters. After Marseilles, Cette is the principal trading port in the south of France, and it is much resorted to as a watering-place. Pop. 32,659.

**Cettigné, Cetinje** (chet-in'ye), the capital of Montenegro, a village in a valley, containing the residence of the prince, government buildings etc., about 10 miles inland from the Adriatic. Pop. 3000.

**Cetyl** (set'il), an alcoholic radical supposed to exist in a series of compounds obtained from spermaceti.

**Ceuta** (sū'ta), a strongly fortified seaport in Morocco, possessed by the Spaniards, on a peninsula of the African coast opposite Gibraltar, the seat of a bishop. Ceuta is used as a place of transportation for criminals. Pop. 13,000.

**Cevadilla.** See *Sabadilla.*

**Cevennes** (sė-venz'; Latin, *Cebennæ*), a chain of mountains in the southeast of France, in the widest sense extending from the Pyrenees in the southwest to the Vosges in the northeast, the Côte d'Or being sometimes considered as a part of it, sometimes as a part of the Vosges system. The length of the chain, exclusive of the Côte d'Or, is about 330 miles, the average height not more than 3000 feet. It is divided into two sections, the Northern and Southern Cevennes; the dividing point is Mount Lozère, in the department of the same name, 5582 feet high. The highest peak is Mezenc, 5753 feet. The Cevennes form the watershed between the Bay of Biscay and the Mediterranean, separating the basins of the Garonne and Loire from those of the Rhone and Saône. They are rich in minerals, containing mines of copper, iron, lead, and coal, and quarries of granite, porphyry, marble, and plaster. The Cevennes were the scene of persecutions of the Albigenses, Waldenses, and others holding opinions opposed to those of the Roman Church.

**Ceylon** (si-lon'; native name *Singhala*, ancient *Taprobāné*), an island belonging to Great Britain in the Indian Ocean, 50 to 60 miles southeast of the southern extremity of Hindustan, from which it is separated by the Gulf of Manaar and Palk Strait, and by a chain of sand-banks, called Adam's Bridge, impassible by any but very small vessels. Length, about 270 miles north to south; average breadth, 100 miles; area, 24,702 sq. m., or a sixth less than Scotland. The island is pear-shaped—the small end to the north. There are few important indentations. At Trincomalee, on the northeast coast, there is one of the finest natural harbors in the world. Point de Galle, on the south coast, is a regular place of call for vessels of various lines. A safe and commodious harbor has been provided for Colombo, the capital (on the west coast). The north and northwest coasts are flat and monotonous; those on the south and east bold, rocky, and picturesque, with exuberant vegetation. The mountainous regions are confined to the center of the south and broader part of the island. Their average height is about 2000 feet, but several summits are upwards of 7000 and one over 8000 feet high, the culminating point being Pidurutallagalla, 8296 feet. Adam's Peak, reaching 7420 feet, is the most remarkable from its conical form, the distance from which it is visible from the sea, and from the legend that thence Buddha ascended to heaven, leaving in evidence a gigantic footprint. The rivers, though numerous, especially on the south and southwest, are merely mountain streams, navigable only by canoes, and that but for a short distance from their mouths. The most important, the Mahawelli-ganga, which rises near Adam's Peak, and falls into the sea by a number of branches near Trincomalee, has a course of 134 miles, and drains upwards of 4000 square miles. There are a few pretty extensive lagoons

in the island yielding large quantities of salt, but no lakes worth noticing.

In respect of climate, it is found that where the jungle has been cleared away and the land drained and cultivated, the country is perfectly healthy; but where low wooded tracts and flat marshy lands abound it is malarial and insalubrious. The east part of the island, being exposed to the northeast monsoon, has a hot and dry climate, resembling that of the coast of Coromandel; while the west division, being open to the southwest monsoon, has a temperate and humid climate like that of the Malabar coast.

Most of the animals found on the opposite continent are native to his island, excepting the tiger. Elephants are numerous, especially in the north and east provinces, and licenses for their capture and exportation are issued by government. The wild life of the island includes bears, buffaloes, leopards, hyenas, jackals, monkeys, wild hogs, several species of deer, porcupines, armadilloes, mungooses, the pangolin or scaly anteater, the loris or Ceylon sloth, flying-foxes, crocodiles, numerous snakes, some poisonous, and a great variety of birds of brilliant plumage. In the luxuriance of its vegetable productions Ceylon rivals the islands of the Indian Archipelago, and in some respects bears a strong resemblance to them. Its most valuable products are coffee, tea, rice, cinnamon (which is almost exclusively in the southwest), and the cocoanut and Palmyra palm. Of these, coffee was formerly the most extensively cultivated, but disease has much reduced the product, and tea cultivation has been taken up in its place, and has grown very large, Ceylon now ranking third among the tea-producing countries of the world. The south parts of the island produce the jaggery-palm, the sap of which yields a coarse sugar, and its fruit a substitute for rice-flour. The taliput-palm, the jack and bread-fruit trees are abundant, and the Ceylon arecanut, celebrated for its superior qualities, is exported in large quantities. Excellent tobacco is raised in the north district. The island abounds with timber of various descriptions, including ebony, satin, rose, sapan, iron, jack, and other beautiful woods adapted for cabinet work. Attention has been directed latterly to the cultivation of cinchona, cacao, and silk. The chief mineral products are iron, plumbago or graphite, and a variety of gems, including sapphires, rubies, etc. The pearl-fisheries of Ceylon are famous, but, for some unexplained reason, sometimes fail for years, there having been none between 1837 and 1854, or between 1863 and 1874. When the pearl-fishery is in existence it is confined to the Gulf of Manaar. The fishery is a government monopoly.

The commerce of Ceylon has become important. The exports comprising tea, coffee, plumbago, arecanuts, cocoanut oil, fiber and kernels (copra), cinnamon, cinchona, cacao, etc. The principal articles of import are manufactured goods, chiefly from Great Britain, as cotton manufactures, apparel and haberdashery, iron and steel manufactures, machinery, etc.; from other countries dried fish, rice, wheat, sugar, tea, cowries, etc. The island is provided with a system of excellent roads, and the railways are developing. The chief industry is agriculture; manufactures (coir-matting, baskets, cotton cloth, etc.) are unimportant. The Ceylon currency consists of rupees (present value about 1*s.* 6*d.*) and cents. The weights and measures are those of Britain.

Ceylon is one of the British crown colonies, the government being conducted by a governor and two councils, executive and legislative, of both of which the governor is president. The present population is composed of Singhalese or Cingalese, who are the Ceylonese proper, Tamils (from India), Moormen or Moors, Malays, Veddahs, a small proportion of Europeans and their descendants, and negroes. The Singhalese are in stature rather below the middle size; their limbs slender, but well shaped, eyes dark, finely-cut features, hair long, smooth, and black, turned up and fixed with a tortoise-shell comb on the top of the head; color varying from brown to black, or rather from the lightest to the darkest tints of bronze. The general population of the island was decreasing for several centuries. It is now, however, on the increase, and latterly this increase has been rapid. The last census gives the population as 4,263,097.

Buddhism prevails in the interior, and generally among the Singhalese of the seacoasts. The Singhalese have a colloquial language peculiar to themselves, but their classic and sacred writings are either in Pali or Sanskrit. The Hindu religion (Brahmanism) prevails among the Tamils or population of Indian extraction, which forms a large proportion of the inhabitants of the north and northeast districts. The Tamils speak their own Tamil tongue. The government has a department of public instruction, and the total number of scholars in government and other schools is about 120,000. On the west and southwest coast numbers of the Singhalese profess the Roman Catholic religion, and there are various Protestant churches and chapels. The

total number of Christians is about 300,000, of whom over 200,000 are R. Catholics.

The Singhalese possess a native chronicle, the *Mahawanso*, which records the history of the island from 543 B.C. onward, under a long series of kings reigning most frequently at the ancient capital Anuradhapura, the earliest of these being leader of an invading host from India. Buddhism was introduced 307 B.C. These incomers brought with them the civilization of India; a great part of the country became covered with towns and villages having temples and dagobas. The capital, Anuradhapura, was, as its ruins still testify, a place of great extent and magnificence. The island was not known to Europeans till the time of Alexander the Great, and their knowledge of it was long vague and meager. By the time of Pliny it had become better known, and he gained much additional information from Ceylonese envoys that were sent to Rome. In the middle ages the country was much troubled by invasions of the Malabars, and for a time it was even tributary to China. It had greatly declined in prosperity when visited by Europeans, the first of whom was Marco Polo in the end of the 13th century. At its most flourishing period its population was probably ten times as great as at present. Little, however, was known in Europe regarding the island until 1505, when the Portuguese established a regular intercourse with it, and latterly made themselves masters of it. When they arrived the Malabars were in possession of the north, the Moors or Arabs held all the seaports, the rest was under petty kings and chiefs. The Portuguese, who were cruel and oppressive rulers, were subsequently expelled by the Dutch in 1658, after a twenty years' struggle. The Dutch in turn were driven from the island by the British in 1796, though a part of the island remained independent under native princes. The King of Kandy, nominally the sovereign of the island, was deposed in 1815 on account of his cruelties, and the island was then finally annexed by Britain, though a rebellion had to be put down in 1817. The principal towns are Colombo (the capital), Kandy, Point de Galle, Jaffna, and Trincomalee.

**Ceylon Moss,** a name of agar-agar.

**Cézanne** (sā-zăn'), PAUL, a famous French painter, born at Aix, Provence, in 1839; died in 1906. After studying at the Ecole Suisse joined the Impressionists, but differing with them he retired in 1879 to Aix, where he spent the remainder of his life in seclusion. His aim was to unite Impressionism with the great art of the past and he developed a style of remarkable originality which has exercised a profound influence upon all modern art.

**Chablais** (shâ-blā), a district of France, in Savoy, south of the Lake of Geneva. In the 11th century Chablais passed from the possession of the house of Burgundy to that of Savoy, and was finally ceded to France with the rest of Savoy in 1860.

**Chablis** (shâ-blē), a town of France, dep. Yonne, famous for white wines of a beautiful clear and limpid color, good body, and extreme delicacy of flavor. Pop. (1906) 2227.

**Chabot** (shâ-bō), FRANÇOIS, one of the leading Jacobins of the French revolution, was born in 1759. Being chosen deputy to the national convention, he displayed the greatest zeal in the propagation of revolutionary ideas and in denouncing the court. The conversion of the cathedral of Nôtre Dame into the Temple of Reason is said to have originated with Chabot. He at last became suspected by his party, appealed in vain to Robespierre, and attempted to poison himself, but was guillotined in 1794.

**Chacma.** See *Baboon.*

**Chaco.** See *Gran Chaco.*

**Chad.** See *Tchad.*

**Chæronea** (kē-ro-nē'a), an ancient Greek town in Bœotia, famous as the scene of a battle fought B.C. 338, when Philip of Macedon crushed the liberties of Greece.

**Chætodontidæ.** See *Squamipennes.*

**Chafer** (chā'fer), a term loosely applied to certain insects of the beetle order, especially such as themselves or their larvæ are injurious to plants.

**Chaffee** (chaf'fē), ADNA ROMANZA, an American soldier, born at Orwell, Ohio, in 1842. He went into the Civil war as a private and rose to the rank of lieutenant. Afterwards he served against the Indians, becoming lieutenant-colonel in 1890. He went into the Cuban war as brigadier-general of volunteers, and was chief of staff to the Governor of Cuba in 1899. In 1900 he commanded the forces in China during the Boxer outbreak as major-general of volunteers; commanded department of the East in 1901–02, and in 1904 was

made lieutenant-general and chief of staff in the U. S. army. General Chaffee reached the age of retirement in 1906. He served on the advisory board of the great aqueduct designed to bring water from the mountains of California to Los Angeles and the neighboring towns. Died Nov. 1, 1914.

**Chaffinch** (chaf'insh; *Fringilla cœlebs*), a lively and handsome bird of the finch family, common in Europe, where its haunts are chiefly gardens and shrubberies, hedgerows, plantations, etc. The male is 6 or 7 inches in length, and is very agreeably colored, having a chestnut back, reddish-pink breast and throat, and a yellowish-white bar on the wings. The food consists of seeds and of insects and their larvæ. The nest, which is generally placed in the fork of a tree, is an elegant structure usually covered with moss and lichens.

**Chagos Islands** (chā'gōs), a group of islands in the Indian Ocean belonging to Britain; a southward extension of the Maldive Islands. The largest, called Diego Garcia or Great Chagos, 100 miles S. of the main group, is about 15 miles long by 3 broad. They are scantily peopled, and the chief product is cocoanut oil.

**Chagres** (chä'gres), a small seaport of Panama, on the Pacific coast, at the mouth of the Chagres River, formerly of some importance. It is now superseded by Colon, and its population has dwindled to 1000.

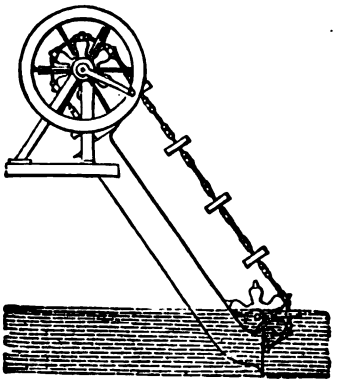
**Chain,** in surveying, is a measure consisting of 100 links, each 7.92 inches in length, and having a total length of 4 rods, or 66 feet. It is sometimes called Gunter's chain, from its inventor.

**Chain-armor,** coats and other pieces of mail, formed of hammered iron links, constituting a flexible garment.

**Chain-pump,** a pump consisting in principle of an endless chain equipped with a number of valves or buckets moving round two wheels, one above and one below. The chain in its ascent passes through a tube closely fitting the valves or buckets, the water being discharged either from the top of the tube or from an orifice in it.

**Chains,** strong links or plates of iron, the lower ends of which are bolted to a ship's side, used to contain the blocks called *dead-eyes*, by which the shrouds of the masts are fastened.

**Chain-shot,** two cannon-balls connected by an iron chain, which, when discharged, revolve upon their shorter axis, and mow down masts, rigging, etc.



Chain-pump.

**Chair of St. Peter,** AT ROME, a wooden chair overlaid with ivory work and gold, first mentioned by Ennodius in 500, and in honor of which a feast was instituted by Paul IV, in 1558.

**Chalcedon** (kal-sē'don), a Greek city of ancient Bithynia, opposite Byzantium (Constantinople), at the entrance of the Black Sea, about 2 miles S. of the modern Scutari. It was a flourishing town when it came into possession of the Romans, under the testament of Nicomedes, B. C. 74, as included in the kingdom of Bithynia. It was finally destroyed by the Turks, by whom it was taken about 1075. In ecclesiastical history it is important as the place at which, in 451, Marcian held the general council for destroying the influence of Dioscuros and the Monophysites by formulating the belief in the existence of two natures in Christ.

**Chalcedony** (kal-sed'o-ni), a mineral, a valued variety of quartz, called also white agate, resembling milk diluted with water, semitransparent or translucent, and more or less clouded with circles and spots. It is found usually in cavities of rocks uncrystallized, in veins, botryoidal masses, etc., and is used in jewelry. There are several varieties, such as the common chalcedony, chrysoprase, sard, and sardonyx.

**Chalcis** (kal'sis), a Greek town, anciently the chief town of Eubœa, separated by the narrow strait of Euripus from the Bœotian coast, on the mainland of Greece, with which it was connected by a bridge. Chalcis,

which is mentioned by Homer, early became one of the greatest of the Ionic cities, carrying on an extensive commerce, and planting numerous colonies in Syria, Macedonia, Italy, Sicily, and the islands of the Ægean Sea. It was subsequently a place of importance under the Romans. There is still a town on the site, consisting of an inner walled town and an outer suburb, and said to be one of the prettiest and most attractive of Greek provincial towns. A bridge, so constructed as to let vessels pass through, connects it with the mainland. Pop. 12,250.

**Chalcondylas** (kal-kon'di-las), DEMETRIUS, a Greek grammarian, born at Athens about 1424. On the taking of Constantinople by the Turks he came to Italy, was invited to Florence by Lorenzo de' Medici about 1479, and afterwards by Ludovico Sforza to Milan, where he died in 1510 or 1511. He did much to further the study of the Greek language and literature in the west of Europe.

**Chaldæa** (kal-dē'a), in ancient geography, the southerly part of Babylonia, or in a wider sense corresponding to Babylonia itself. The name was of comparatively late origin, the old titles of the country being Accad and Shumer. The name Chaldæans was eventually applied to a portion of the Babylonian Magi, who were devoted to the pursuit of astronomy and magical science. See *Babylonia*.

**Chaldee Language** (kal'-dē), a name often given to the Aramean language (or a dialect of it), one of the principal varieties of the ancient Semitic. Chaldee literature is usually arranged in two divisions: the Biblical Chaldee, or those portions of the Old Testament which are written in Chaldee, namely, Daniel, from ii, 4, to vii, 28; Ezra, iv, 8, to vi, 18; and vii, 12–26; and Jeremiah, x, 11; and the Chaldee of the Targums and other later Jewish writings. See *Aramaic*.

**Chaldron** (chąl'dron), an old English measure of 36 bushels; also a U. S. measure, 26¼ hundredweight.

**Chaleur Bay** (sha-lör'), an inlet of the Gulf of St. Lawrence, between Quebec and New Brunswick. The French fleet was here defeated by the British in 1760.

**Chalice** (chal'is), a term generally applied to a communion cup for the wine in the Eucharist, often of artistic and highly ornamental character.

**Chalk** (chąk), a well-known earthy limestone, of a white color, soft, and admitting no polish. It is an impure carbonate of lime, and is used as an absorbent and antacid, and for making marks for various purposes, as on the blackboard in schools, and by artisans and others.—*Black chalk* is a soft variety of argillaceous slate. (See *Black Chalk*.)—*Brown chalk*, a familiar name for umber.—*Red chalk*, another name for ruddle. *French chalk*, steatite, soapstone, or talc, a soft magnesian mineral.—*Drawing chalks* were originally restricted in colors to white, black, and red, but now chalks of every color are used, and are known by the name of *crayons*.—In geology chalk is the rock which forms the higher part of a series or group of strata, comprising rocks of different kinds, termed the cretaceous system (which see).

**Challenge** (chal'enj), to jurors, is an objection either to the whole panel or array, that is, the whole body of jurors returned, or to the *polls*, that is, to the jurors individually; and it is either *peremptory*, that is, without assigning any reason, or *for cause* assigned. See *Jury*.

**Challis** (shal'i), an elegant dress fabric of silk and worsted introduced at Norwich in 1832, soft and pliable and with a clothy surface.

**Chalmers** (chą'mėrz, chal'merz), ALEXANDER, a British journalist, editor, and miscellaneous writer, born at Aberdeen in 1759, where his father, the founder of the first Aberdeen newspaper, was a printer. About 1777 Chalmers came to London, was employed as journalist, and edited the *British Essayist*, from the *Tatler* to the *Observer*, published 1803. He also issued an edition of Shakespere, with notes, in 1809; and the works of the English Poets from Chaucer to Cowper, with Johnson's *Lives*, and additional *Lives* in 1810. His most extensive work was the *General Biographical Dictionary*, thirty-two vols., 1812–17. He died in London in 1834.

**Chalmers,** GEORGE, a Scotch antiquary born in 1742, studied law at Edinburgh, and removed to America, where he practised for upwards of ten years. On his return he was appointed in 1786 clerk to the Board of Trade, an office held by him till his death in 1825. He published various political and statistical works, lives of Daniel Defoe and Thomas Ruddiman, and edited the works of Ramsay and Lindsay; but his chief work was his *Caledonia*, a laborious historical and topographical account of North Britain from the most ancient to recent times.

**Chalmers,** THOMAS, an eminent Scottish divine, born in 1780, at Anstruther Easter, Fife. He studied at the University of St. Andrews, and was licensed as a preacher in 1799, afterwards becoming assistant to the professor of mathematics at St. Andrews. In 1803 he was presented to the parish of Kilmany, in Fife, where he made a

Thomas Chalmers, D.D.

high reputation as a preacher. In 1808 he published an *Inquiry into the Extent and Stability of National Resources.* In 1813 his article on Christianity appeared in the *Edinburgh Encyclopædia*, and shortly afterwards his review of Cuvier's *Theory of the Earth*, in the *Christian Instructor.* His fame as a preacher had by this time extended itself throughout Scotland, and in 1815 he was inducted to the Tron Church of Glasgow. His astronomical discourses delivered there in the following winter produced a sensation not only in the city but throughout the country, 20,000 copies selling in the first year of their publication. In 1819 he was transferred from the Tron to St. John's, a church built and endowed expressly for him by the Town Council of Glasgow, but his health having been tried by overwork he accepted, in 1823, the chair of moral philosophy at St. Andrews. In 1827 he was elected to the divinity chair in the University of Edinburgh, an appointment which he continued to hold till the Disruption from the Scottish church in 1843. In 1832 he published his *Political Economy*, and shortly afterwards his Bridgewater Treatise *On the Adaptation of External Nature to the Moral and Intellectual Constitution of Man.* During this period he was occupied with the subject of church extension on the voluntary principle, but it was in the great non-intrusion movement in the Scottish church that his name became most prominent. Throughout the whole contest to the Disruption in 1843 he acted as the leader of the party that then separated from the establishment, and may be regarded as the founder of the Free Church of Scotland, of the first assembly of which he was moderator. Having vacated his professorial chair in the Edinburgh University, he was appointed principal and primarius professor of divinity in the new college of the Free Church. He died May 30, 1847.

**Châlon-sur-Saône** (shă-lō n-sür-sōn), a town of France, dep. Saône-et-Loire, on the right bank of the Saône, which here becomes navigable for steamboats, and at the commencement of the Canal du Centre. It has a cathedral of the 13th century, a fine river quay, an exchange, communal college, etc. There are foundries, dye-works, etc., and a flourishing trade. Pop. 26,538.

**Châlons-sur-Marne** (shă-lō n-sür-marn), a city of France, capital of the department Marne (Champagne), on the right bank of the river Marne. The principal public buildings are the cathedral, a fine edifice in the Gothic style; three other interesting Gothic churches; the Hôtel de Ville, built in 1772; the Hôtel de la Préfecture, built in 1764, one of the finest buildings of the kind in France. There are manufactures of woolen and cotton goods; also cotton mills, tanneries, etc. In 451 Attila was defeated before the walls of Châlons, and from the 10th century it flourished as an independent state under counts-bishops, having about 60,000 inhabitants. After being united to the French crown in 1360, it declined. A celebrated camp was established by Napoleon III about 18 miles from Châlons for the purpose of training the French troops, still to some extent employed. Pop. 21,487.

**Chalybeate Waters** (ka-lib'ē-āt), waters holding iron in solution, either as a carbonate or as a sulphate with or without other salts. All waters containing iron are distinguished by their styptic, inky taste, and by giving a more or less deep color with an infusion of tea or of nutgalls.

**Chalybite** (kal'i-bīt), an ore of iron, a native anhydrous metacarbonate ($FeCO_3$), existing abundantly under the name of *spathic* or *sparry ore*, or *siderite.* A siliceous or argillaceous variety called clay ironstone, occurring in the coal-measures, is one of the most

abundant and valuable ores of iron. Combined with carbonaceous matter it forms the black-band ironstone.

**Chama** (kā'ma), the gaping cockle, a genus of large marine bivalves. The giant clam, *Chama gigas*, is the largest shell yet discovered, sometimes measuring four feet across. It is found in the Indian Ocean.

**Chamade** (sha-mād'), a military term for the beat of a drum or sound of a trumpet inviting an enemy to parley.

**Chamærops** (ka-mē'rops), a genus of palms belonging to the northern hemisphere, and consisting of dwarf trees with fan-shaped leaves born on prickly petioles, and a small berry-like fruit with one seed. The *C. humilis* is the only native European palm. It does not grow farther north than Nice. The fibers of its leaves form an article of commerce under the name of *crin végétal* (vegetable hair). Brazilian grass is a fiber obtained from the *Chamærops argentĕa*. A Chinese species, *C. Fortunei*, is quite hardy in the south of England.

**Chamalari** (cham-a-lā'rē), CHAMALHARI, a peak of the Himālaya Mountains, at the western extremity of the boundary line between Bhutan and Tibet. Height, 23,929 feet.

**Chamber** (chām'bėr), a word used in many countries to designate a branch of government whose members assemble in a common apartment, as the *chamber* of deputies in France, or applied to bodies of various kinds meeting for various purposes. The *imperial chamber* (in German, *Reichskammergericht*) of the old German Empire was a court established at Wetzlar, near the Rhine, by Maximilian I in 1495, to adjust the disputes between the different independent members of the German Empire, and also such as arose between them and the emperor.—*Chambers of commerce* are associations of the mercantile men of towns for the purpose of protecting and furthering the interests of the commercial community.

**Chamberlain** (chām'bėr-lin), an officer charged with the direction and management of the private apartments of a monarch or nobleman. The *lord-chamberlain* or *lord-great-chamberlain* of Great Britain is the sixth officer of the crown. His functions, always important, have varied in different reigns. Among them are the dressing and attending on the king at his coronation; the care of the palace of Westminster (Houses of Parliament); and attending upon peers at their creation, etc. The office of *lord-chamberlain of the household* is quite distinct from that of the great-chamberlain, and is changed with the administration. This officer has the control of all parts of the household (except the ladies of the queen's bedchamber) which are not under the direction of the lord-steward, the groom of the stole, or a master of the horse. The king's (queen's) chaplains, physicians, surgeons, etc., as well as the royal tradesmen, are by his appointment; the companies of actors at the royal theaters are under his regulation; and he is also the licenser of plays.

**Chamberlain,** JOSEPH, an English statesman, born in London in 1836, and educated at London University school. He became a member of a firm of screw-makers at Birmingham, but gave up active connection with the business in 1874. He early became prominent in Birmingham both in connection with civic and political affairs, being an advanced radical and an able speaker, was chairman of the school-board, and thrice in succession mayor of the city (1874–76). In 1876 he entered parliament as a representative of Birmingham, and at the general election of 1880 he was chosen for the same city along with Mr. Bright and Mr. Muntz. Under Mr. Gladstone's premiership he now became president of the Board of Trade, and a cabinet-minister, and was able to pass the Bankruptcy Act now in force, though he failed with his merchant shipping bill. In the Gladstone government of 1886 he was president of the Local Government Board; but his leader's Irish policy caused him to resign, and since then, as member for West Birmingham, he has been an active member of the Liberal-Unionist party. He was Colonial Secretary under Salisbury and Balfour, 1895–1905, and as such had much to do with bringing on the war in South Africa. His later advocacy of a protective tariff brought on a schism in the Unionist party which led to the resignation of the ministry in December, 1905, followed by an overwhelming Liberal triumph in the general elections of 1906. He died July 3, 1914.

**Chamberlain,** JOSHUA LAWRENCE, born at Brewer, Maine, in 1828; entered the army in 1862, was promoted brigadier-general on the battlefield by General Grant in 1864, and made brevet major-general in 1865. He was governor of Maine 1866–71, and President of Bowdoin College 1871–83. He wrote, *Maine: Her Place in History; Sovereignty and Sacrifice; American Ideals; The New Nation*, etc.

**Chamberlin,** THOMAS CHROWDER, geologist, born near Maltown, Illinois, in 1843; graduated at Beloit College in 1866; professor of geology there in 1872, and state geologist for his cousin in 1876. He was president of the University of Wisconsin 1887–92, and became professor of geology in the University of Chicago in 1892. He was the geologist of the Peary Relief Expedition in 1894, and was appointed in 1882 U. S. geologist in charge of the glacial division.

**Chambers** (chām'bẽrz), EPHRAIM, a miscellaneous writer, and compiler of a popular *Dictionary of Arts and Sciences*, born at Kendal, in Westmoreland, in the latter part of the 17th century. During his apprenticeship to a mathematical instrument and globe-maker in London he formed the design of compiling a *Cyclopædia*, and even wrote some of the articles for it behind his master's counter. The first edition was published in 1728. Several subsequent editions appeared previously to his death in 1740, and it was the basis of the cyclopædia of Dr. Abraham Rees.

**Chambers,** ROBERT, historical and miscellaneous writer, the younger of two brothers originally composing the publishing firm of W. & R. Chambers, was born at Peebles in 1802, his father being a muslin weaver. At the age of sixteen, with a collection of family books worth about $10, he began business as a bookseller in Edinburgh, his brother William, two years his senior, establishing himself near by as a printer: Robert's *Illustrations of the Author of Waverly*, his *Traditions of Edinburgh*, and other works relating to Scotland, were very favorably received, and in 1832 the two brothers commenced *Chambers' Edinburgh Journal*, the success of which was very great. From that time they united in the publishing business, establishing a successful house which still exists, one of its best known publications being *Chambers' Encyclopædia*. Robert was active in authorship, his most important work being the once famous *Vestiges of Creation*, which was not positively known to be his until years after his death, which occurred in 1871. William, who died in 1883, was also an author of various works, and presented his native town of Peebles with an institution embracing a library, reading-room, museum, etc.

**Chambersburg** (chām'bẽrs-burg), a town, capital of Franklin Co., Pennsylvania, 52 miles S. W. of Harrisburg. It has iron works and various other manufactures. In 1864 a large part of the town was burned by a party of cavalry raiders from the Confederate army. Pop. 11,800.

**Chambertin** (shäṅ-ber-taṅ), a superior kind of red Burgundy wine, named after the place where it is produced.

**Chambéry** (shäṅ-bā-ri), a town of S. E. France, capital of department Savoie. It is an archbishop's see, and contains a cathedral, a castle, now the prefecture, the palace of justice, barracks, etc. The old ramparts have been converted into public walks. In its vicinity are excellent baths, much frequented in summer. It has manufactures and distilleries. Pop. 16,852.

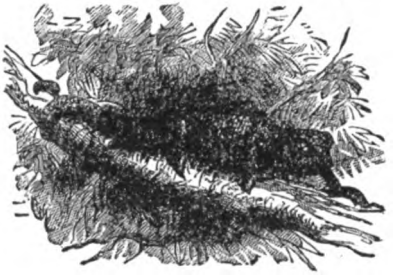
**Chambord** (shäṅ-bōr), a castle, park, and village, near Blois, department of Loir-et-Cher, in France. The splendid castle, in the Renaissance style, was mainly built by Francis I, being begun in 1526, and was completed under Louis XIV. In 1745 it was given by Louis XV to Marshal Saxe, who died there in 1750. Napoleon gave it to Berthier, and in 1821 a company of Legitimists bought it and gave it to the Duke of Bordeaux (see next art.) in name of the people of France.

**Chambord** (shäṅ-bōr), HENRI CHARLES FERDINAND MARIE DIEUDONNÉ, COMTE DE, Duke of Bordeaux, the last representative of the elder branch of the French Bourbon dynasty, called by his partisans Henry V of France. He was born in 1820, seven months after the assassination of his father, Prince Charles Ferdinand d'Artois, Duke de Berry. Charles X, after the revolutionary outbreak of 1830, abdicated in his favor; but the young count was compelled to leave the country with the royal title unrecognized by the nation. He lived successively in Scotland, Austria, Italy, and London, keeping a species of court, and occasionally issuing manifestoes. In 1846 he married the Princess Maria Theresa, eldest daughter of the Duke of Modena; and in 1851 inherited the domain of Frohsdorf, near Vienna, where for the most part he subsequently resided. While abstaining from violent attempts to seize the crown, he let slip no opportunity of urging his claims, especially after Sedan; but his belief in divine right, his devotion to the see of Rome, and his failure to recognize accomplished facts and modern tendencies, destroyed all chance of his succession. He died in 1883, leaving no heir.

**Chambre Ardente** (shäṅ-br ärdänt; *fiery chamber*), the name formerly given in France to an apartment, hung with black

and lighted with tapers, in which sentence of death was pronounced on heinous offenders. The name was afterwards more especially given to those extraordinary tribunals which, from the time of Francis I, ferreted out heretics by means of a system of espionage, directed the proceedings against them, pronounced sentence, and also saw it carried into execution.

**Chameleon** (ka-mē'li-on), a genus of reptiles belonging to the Saurian or lizard order, a native of parts of Asia, Africa, and the south of Europe. The best-known species, *Chamæleo Africānus* or *C. vulgāris*, has a naked body 6 or 7 inches long, with a prehensile tail of about 5 inches, and



Chameleon (*Chamæleo Africanus*).

feet suitable for grasping branches. The skin is cold to the touch, and contains small grains or eminences of a bluish-gray color in the shade, but in the light of the sun all parts of the body become of a grayish-brown or tawny color. It possesses the curious faculty, however, of changing its color, either in accordance with its environment or with its temper when disturbed, the change being due to the presence of clear or pigment-bearing contractile cells placed at various depths in the skin, their contractions and dilatations being under the influence of the nervous system. Their power of fasting and habit of inflating themselves gave rise to the fable that they lived on air, but they are in reality insectivorous, taking their prey by rapid movements of a long, viscid tongue. In general habit they are dull and torpid.

**Chameleon Mineral,** a name given to manganate of potassium, because a solution of it changes from green, through a succession of colors, to a rich purple.

**Chamfort** (shäṇ-fōr), Sebastien-Roch Nicolas, a French man of letters, wit, and revolutionist, born in 1741. By his success as dramatist, critic, and conversationist he obtained a place in the French Academy, a pension, and a post at court. An intimate friend of Mirabeau, he threw himself heartily into the revolution, was secretary to the club of the Jacobins, was one of the first of the storming party in the attack on the Bastille, and having been employed by Roland in the *Bibliothèque Nationale* published the first twenty-six *Tableaux Historiques de la Révolution*. His cynical wit could not, however, restrain itself, and he was denounced and threatened with imprisonment. Rather than undergo it he inflicted fatal injuries upon himself, dying in 1794. He is seen at his best in the collection of *bon mots* published under the title of *Chamfortiana*.

**Chamier** (sham'i-ér), Frederick, an English writer of fiction, born in 1796; died in 1870. He entered the navy, took part in the last campaigns against the French, and distinguished himself in the American war of 1812. He retired in 1833, with the rank of captain. His principal works are, *The Life of a Sailor; Ben Brace; The Arethusa; Jack Adams* and *Tom Bowline*.

**Chamisso** (shä-mis'ō), Adelbert de, a German poet, French by birth, born at the castle of Boncourt, in Champagne, in 1781. His family being driven to Berlin by the revolution, he became, from 1796 to 1798, page to the queen-mother, and afterwards entered the Prussian service, where he remained till 1808. He then revisited France; but shortly after returned to Prussia, and for three years devoted himself to the study of natural science at Berlin. In 1815 he accompanied as naturalist an expedition for the discovery of the north-west passage, and on his return took up his residence at Berlin, where he was appointed superintendent of the botanic garden. He died at Berlin in 1838. He wrote several works on natural history and botany, and an account of his voyage, but his reputation as a naturalist has been somewhat eclipsed by that which he acquired as a poet. In 1804–6, in concert with Varnhagen von Ense, he published a collection of poems, under the name of the *Muses' Almanac;* and in 1813 appeared his famous tale, *Peter Schlemihl, or the Shadowless Man*, the plot suggested by a casual question of Fouqué's. Many of his ballads and songs are masterpieces in their way and still maintain their popularity.

**Chamois** (sham'wą; *Antilöpe rupicapra*), a species of goat-like antelope inhabiting high, inaccessible

mountains in Europe and Western Asia. Its horns, which are about 6 or 7 inches long, are round, almost smooth, perpendicular and straight until near the tip, where they suddenly terminate in a hook directed backwards and downwards. Its hair is brown in winter, brown fawn

Chamois (*Antilope rupicapra*).

color in summer, and grayish in spring. The head is of a pale yellow color with a black band from the nose to the ears and surrounding the eyes. The tail is black. Its agility, the nature of its haunts, and its powers of smell render its pursuit an exceedingly difficult and hazardous occupation.

**Chamomile,** or CAMOMILE (kam'o-mīl; *Anthĕmis nobilis*), a well-known plant belonging to the natural order Compositæ. It is perennial, and has slender, trailing, hairy, and branched stems. The flower is white, with a yellow center. Both leaves and flowers are bitter and aromatic. The fragrance is due to the presence of an essential oil, called oil of chamomile, of a light blue color when first extracted, and used in the preparation of certain medicines. Both the leaves and the flowers are employed in fomentations and poultices, and also in the form of an infusion as a stimulant stomachic. It is cultivated in gardens in the United States, and also found wild.—Wild chamomile (*Matricaria chamomilla*) is now out of use in England; but its medicinal properties resemble those of common chamomile, and it is still used in some parts of Europe.

**Chamond** (shä-mōn), ST., a manufacturing town of France, department Loire, on the railway from St. Étienne to Lyons. It is well built, has an old castle and a handsome parish church; and has silk factories, large iron-foundries, dye-works, etc. Pop. 15,469.

**Chamouni** (shä-mö-nē), or CHAMONIX (shä-mo-nē), a celebrated valley in France, department Haute-Savoie, in the Pennine Alps, over 3000 feet above sea-level. It is about 12 miles long, by 1 to 6 miles broad, its E. side formed by Mont Blanc and other lofty mountains of the same range, and it is traversed by the Arve. The mountains on the E. side are always snow-clad, and from these proceed numerous glaciers, such as the Glacier de Bossons and the Mer de Glace. The village of Chamouni (pop. 806) is much frequented by tourists, and is one of the points from which they visit Mont Blanc. There is a statue in the village to Saussure who first ascended the peak (1786).

**Champagne** (shan-pàn-y', or sham-pān'), an ancient province of France, which before the revolution formed one of the twelve great military governments of the kingdom. It forms at present the departments of Marne, Haute-Marne, Aube, Ardennes, and part of those of Yonne, Aisne, Seine-et-Marne, and Meuse. Troves was the capital.

**Champagne** (sham-pān'), a French wine, white or red, which is made chiefly in the department of Marne, in the former province Champagne, and is generally characterized by the property of creaming, frothing, or effervescing when poured from the bottle, though there are also *still* Champagne wines. The creaming or slightly sparkling Champagne wines are more highly valued by connoisseurs, and fetch greater prices than the full-frothing wines, in which the small quantity of alcohol they contain escapes from the froth as it rises to the surface, carrying with it the aroma and leaving the liquor nearly vapid. The property of creaming or frothing possessed by these wines is due to the fact that they are partly fermented in the bottle, carbonic acid being thereby produced. Wine of a similar kind can of course be made elsewhere, and some of the German champagnes are hardly to be distinguished from the French. Much artificial or imitation champagne is sold.

**Champaign,** a city of Champaign Co., Illinois, 128 miles S. W. of Chicago, and adjoining Urbana, the county seat. It is the seat of the University of Illinois. It has manufactures of carriages, flour, drain-tiles, etc. Pop. 12,421.

**Champarty** (cham'par-ti), or CHAMPERTY (L. *campi partitio*, a dividing of land), in *law* is a bargain with the plaintiff or defendant in any suit to have part of the land, debt, or other thing sued for, if the party that undertakes it prevails therein, the champertor meanwhile furnishing means to carry on the suit. Such bargains are illegal.

**Champ-de-Mars** (shäṇ-dė-märs), that is Field of Mars, an extensive piece of ground in Paris, used as a place of military exercise. It was here that Louis XVI swore to defend the new constitution of 1790, and it was the site of the exhibitions of 1867 and 1878.

**Champignon** (sham-pin'yon), a name given to the common mushroom (*Agaricus campestris*).

**Champion** OF THE KING, a person whose office it was at the coronation of English monarchs to ride armed into Westminster Hall, and make challenge that if any man should deny the king's title to the crown he was ready to defend it in single combat.

**Champlain** (sham-plān'), LAKE, a lake, chiefly in the United States, between the states of New York and Vermont, but having the north end of it in Canada; extreme length, north to south, about 120 miles; breadth, from a half mile to 15 miles; area, about 600 square miles. It is connected by canal with the Hudson River, and has for outlet the river Richelieu, or Sorel, flowing north to the St. Lawrence. Its scenery is beautiful, and attracts many visitors.

**Champlain** (shäṇ-plaṇ), SAMUEL, a French naval officer and maritime explorer, the founder of Quebec, was born about 1570; died 1635. His exploits in the maritime war against Spain in 1595 attracted the attention of Henry IV, who commissioned him in 1603 to found establishments in North America. He made three voyages for that purpose, in the last of which he founded Quebec, and was in 1620 appointed Governor of Canada. He did much to foster the fur trade and explore the region of the Great Lakes, and he proved an able administrator, but his conflicts with the Iroquois Indians roused a bitter enmity in that confederacy from which Canada long suffered.

**Champollion** (shäṇ-pol-yōṇ), JEAN FRANÇOIS, a French scholar, celebrated for his discoveries in the department of Egyptian hieroglyphics, born at Figeac, department of Lot, in 1790. At an early age he devoted himself to the study of Hebrew, Arabic, Coptic, etc., and in 1809 became professor of history at Grenoble. He soon, however, retired to Paris, where, with the aid of the trilingual inscription of the Rosetta Stone and the suggestions thrown out by Dr. Thomas Young, he at length discovered the key to the graphic system of the Egyptians, the three elements of which—figurative, ideographic, and alphabetic—he expounded before the Institute in a series of memoirs in 1823. These were published in 1824 at the expense of the state, under the title of *Précis du Système Hiéroglyphique des Anciens Egyptiens.* In 1826 Charles X appointed him to superintend the department of Egyptian antiquities in the Louvre; in 1828 he went as director of a scientific expedition to Egypt; and in 1831 the chair of Egyptian archæology was created for him in the Collège de France. He died at Paris in 1832. Other works are his *Grammaire Égyptien, and Dictionnaire Hiéroglyphique.*

**Champollion-Figeac** (shäṇ-pol-yōṇ-fē-zhăk), JACQUES JOSEPH, the elder brother of the preceding, born at Figeac in 1778, died in 1867. His principal works are: *Antiquités de Grenoble*, 1807; *Paléographie Universelle; Annales des Lagides*, 1819; *Traité élémentaire d'Archéologie*, 1843; *Écriture démotique Égyptienne*, 1843; *L'Égypte Ancienne*, 1850.

**Chance.** See *Probability.*

**Chancel** (chan'sel) is that part of the choir of a church between the altar or communion-table and the rail that encloses it.

**Chancellor** (chan'sel-or), a high official in many of the kingdoms of Europe, the office including in its duties the supervision of charters and other official writings of the crown requiring solemn authentication. The title and office are also ecclesiastical, and hence each bishop still has his chancellor, the principal judge of his consistory. In the new German empire, the chancellor (Reichskanzler) is president of the Federal Council, and has the general conduct of the imperial administration. In the United States, a chancellor is the

judge of a court of chancery or equity established by statute.

The *Lord High-chancellor* of Great Britain and Ireland (originally of England), who is also Keeper of the Great Seal, is the first judicial officer of the crown, and exercises an extensive jurisdiction as head of the Supreme Court of Judicature. He ranks as first lay person of the state after the blood-royal. He is a cabinet minister and a privy-councilor in virtue of his office, is prolocutor of the House of Lords by prescription, and vacates his office with the ministry which appoints him. There is also a Lord Chancellor of Ireland, who is the head of the judicial bench. He is not a member of the British ministry. The chancellorship of Scotland was abolished at the union.

The *Chancellor of the Exchequer* is the principal finance minister of the British government, and as all questions of supply originate in the House of Commons, a peer cannot be conveniently appointed to this office. It is sometimes held along with that of first lord of the treasury.

*Chancellor of a university*, the highest honorary official in the university, from whom the degrees are regarded as proceeding. The post in Britain is usually occupied by a person of rank.

**Chancellorsville** (chan'sel-ors-vil), the site of one of the greatest battles of the American Civil war, in which, on the 2d, 3d, and 4th of May, 1863, a victory was gained by the Confederates under Generals Lee and Jackson over the Federal troops commanded by General Hooker. Both armies lost heavily in the battle, the Confederates suffering severely in the loss of their brilliant leader Jackson.

**Chancery** (chan'se-ri), formerly the highest court of justice in England next to Parliament, but since 1873 a division of the High Court of Justice, which is itself one of the two departments of the Supreme Court of Judicature (which see). Formerly it embraced six superior courts called high courts of chancery, viz.: the court of the lord high-chancellor, the court of the master of the rolls, the court of appeal in chancery, and the courts of the three vice-chancellors, with various inferior courts. The jurisdiction of the court was both ordinary and extraordinary, the former as a court of common law, the latter a court of equity. The extraordinary court, or court of equity, proceeded upon rules of equity and conscience, moderating the rigor of the common law, and giving relief in cases where there was no remedy in the common law courts. The Chancery Division now consists of the lord-chancellor as president and five justices. In American law a court of general equity jurisdiction. Separate courts of chancery or equity exist in some of the States; in others the courts of law sit also as courts of equity; in others the distinction between law and equity has been abolished or never existed.

**Chanda** (chân-dä'), a town of India, Central Provinces, surrounded by a wall 5½ miles long, with manufactures and a considerable trade. Pop. about 17,000. It is the capital of a district of the same name.

**Chandausi** (chan-dou-sē'), a town of India, N. W. Provinces, Moradabad district. Pop. about 30,000.

**Chanderi** (chan-dā'rē), or CHANDHAIREE, a town in Central India, Scindia's Dominions, in a hilly and jungly tract, 103 miles S. of Gwalior, formerly of considerable extent and splendor, but now an insignificant place. There is a fort which figured much in the wars of the Mogul dynasty.

**Chandernagore** (chun'der-nug'er), or CHAN'DARNAGAR ('city of sandalwood'), a town in Hindustan, belonging to France, on the right bank of the Hooghly, 16 miles N. N. W. of Calcutta. The French established a formal cession of it, together with its territory of 2325 square acres, from Aurungzebe. It was three times occupied by the British, but was finally restored to the French in 1816. Pop. of town and territory, 25,000.

**Chandpur** (chänd'pur), a town of India, Bijnaur district, N. W. Provinces; thriving, well paved and drained. Pop. about 12,000.

**Chang-Chow** (chäng' chou), one of the largest cities of China, in the province of Fokien, 36 miles W. by S. of Amoy, its port. It has an active trade. Pop. est. 1,000,000.

**Chang-Chow,** a city of China in Kiang-Su province, E. by S. of Nanking. Pop. 360,000.

**Chang-Sha,** a city of China, capital of Hunan province, on the Heng-Hiang. Pop. 250,000.

**Chank-shell,** the common conch-shell (*Turbinella pyrum*), of a spiral form, worn as an ornament by the Hindu women. A shell with its spires or whorls turning to the right is held in peculiar estimation and fetches a high price. The chank is one of the gasteropodous mollusca.

**Channel Islands** (chan'el), a group of islands in the

English Channel, off the W. coast of department La Manche, in France. They belong to Britain, and consist of Jersey, Guernsey, Alderney, and Sark, with some dependent islets. They are almost exempt from taxation, and their inhabitants enjoy besides all the privileges of British subjects. The government is in the hands of bodies called the "states," some members of which are named by the crown, while others are chosen by the people, and others sit *ex officio*. The islands have been fortified at great expense. They form the only remains of the Norman provinces once subject to England. Area 75 sq. miles, pop. (1911) 96,900. See the separate articles.

**Channels,** or CHAIN-WALES, of a ship, broad and thick planks projecting horizontally from the ship's outside, abreast of the masts. They are meant to keep the shrouds clear of the gunwale.

**Channing** (chan'ing), WILLIAM ELLERY, an Unitarian divine and writer, born at Newport, Rhode Island, in 1780. He studied at Harvard College, became a decided Unitarian, and propagated Unitarian tenets with great zeal and success. His first appointment as a pastor was in 1803, when he obtained the charge of a congregation in Boston, and before long he became known as one of the most popular preachers of America. His reputation was still further increased by the publication of writings, chiefly sermons, reviews etc., on popular subjects. He died at Burlington, Vermont, in 1842.—His nephew, WILLIAM HENRY CHANNING, born 1810, also a Unitarian preacher (for some time at Liverpool) and supporter of the socialistic movement, wrote a memoir of his uncle and other works. Died in 1884.

**Chant,** a short musical composition consisting generally of a long reciting note, on which an indefinite number of words may be intoned, and a melodic phrase or cadence. A single chant consists of two strains, the first of three and the second of four bars in length. A double chant has the length of two single ones.

**Chanterelle** (shan-tėr-el'), a British edible mushroom (*Cantharellus cibarius*) of a bright orange color, with a pleasant fruity smell.

**Chantilly** (shăn-tē-yē), a town of France, department of the Oise, 25 miles N. N. E. of Paris, celebrated for a variety of lace made here and in the neighborhood; for the splendid château, built by the great Condé, in great part leveled by the mob at the revolution, but rebuilt by the Duc d'Aumale after the estate came into his possession in 1850. Along with its fine domain and its splendid art collection it was presented by the duke to the French Institute in 1887. Chantilly is a horse-racing center. Pop. 4632.

**Chantrey** (chan'tri), SIR FRANCIS, an English sculptor, born in 1781 near Sheffield, was the son of a well-to-do carpenter. Even in boyhood his chief amusement was in drawing and modeling figures, and he was apprenticed in 1797 to a carver and gilder. In 1802 he commenced work for himself at Sheffield by taking portraits in crayons. After studying at the Royal Academy in London he eventually settled in the metropolis, where he presented numerous busts at the exhibitions of the Royal Academy. This was the commencement of his career of fame and fortune, and he soon came to be regarded as the first monumental sculptor of his time. In 1816 he was chosen an associate and in 1818 a member of the Royal Academy. He was knighted in 1835, and died in 1842. His most celebrated works are the *Sleeping Children*, in Lichfield Cathedral; the statue of Lady Louisa Russell, in Woburn Abbey; the bronze statue of William Pitt, in Hanover Square, London; a statue of Washington, in the State House, Boston; and statues of Horner, Canning, Sir J. Malcolm, etc., in Westminster Abbey.

**Chantry** (chan'tri), an endowment to provide for the singing of masses; also the chapel where the masses are chanted. Chapels were frequently endowed by men who wished to have masses for the repose of their souls.

**Chanute.** (cha'nöt), a city of Neosho Co., Kansas, 110 miles S. S. W. of Kansas City. It is in a petroleum and natural gas region and has railroad machine shops, refineries, cement and brick plants, etc. Pop. 9272.

**Chao-Chow** (châ'o châ'ou), a city of China, province Quangtung, on the river Han, 195 miles N. E. of Hong-Kong, the center of an important maritime division of the province. Pop. est. at 200,000.

**Chaos** (kā'os), in old theories of the earth, the void out of which sprang all things or in which they existed in a confused, unformed shape before they were separated into kinds.

**Chapel** (chap'el), a term applied to buildings of various kinds erected for some sort of religious service. Thus it may mean a subordinate place of worship attached to a large church,

and especially to a cathedral, separately dedicated and devoted to special services. (*See Cathedral.*) Or it may mean a building subsidiary to a parish church and intended to accommodate persons residing at a distance from the latter; or a place of worship connected with a palace, castle, university, etc.

**Chaplain** (chap'lin), literally a person who is appointed to a chapel, as a clergyman not having a parish or similar charge, but connected with a court, the household of a nobleman, an army, a prison, a ship, or the like. Chaplains in the United States service have the assimilated rank of captain. They receive a yearly pay of $1500.

**Chaplet** (chap'let), a string of beads used by Roman Catholics to count the number of their prayers. In heraldry it means a garland of leaves, with four flowers among them at equal distances; in architecture, a small molding carved into beads, pearls, etc.

**Chapman** (chap'man), in general a merchant or trader, but in modern times more specifically a hawker or one who has a traveling booth.

**Chapman,** GEORGE, an English poet, the earliest, and perhaps the best, translator of Homer, was born in 1557, and died in 1634. He was educated at Oxford, and in 1576 proceeded to London; but little is known of his personal history. His translation of the *Iliad* was published in three separate portions in 1598, 1600, and 1603. It has been highly commended by such poets as Pope, Keats, and Coleridge, as also by Lamb. Keats's sonnet, *On First Looking into Chapman's Homer* ('Then felt I like some watcher of the skies,' etc.), is well known. In 1614 appeared his translation of the *Odyssey*, followed in the same year by that of the *Battle of the Frogs and Mice* and the *Homeric Hymns*. He also translated Hesiod's *Works and Days*, and portions of various classic poets. He wrote numerous plays, almost all now forgotten, though containing some fine passages.

**Chapoo** (chä'pö'), a seaport of China, province Chekiang, on the N. side of a large bay, 35 miles N. from Ningpu. It carries on a considerable trade with Japan.

**Chapra** (chap-rä'). See *Chuprah.*

**Chaptal** (shap-tal), JEAN ANTOINE CLAUDE, Count de Chanteloup, peer of France, was born in 1756, and devoted himself to the study of medicine and the natural sciences, and especially chemistry. He supported the revolution, and was appointed in 1799 counselor of state, and in 1800 minister of the interior, in which post he encouraged the study of the arts and established a chemical manufactory in the neighborhood of Paris. In 1805 he was made a member of the senate. On the restoration he was obliged to retire to private life, but in 1816 the king nominated him a member of the Academy of Sciences, and latterly made him a peer. Chaptal's works on national industry, chemistry, the cultivation of the vine, etc., were very much esteemed, especially his *Chimie Appliquée aux Arts* (Paris, 1807, four vols.), his *Chimie Appliquée à l'Agriculture* (Paris, 1823, two vols.), and *De l'Industrie Française* (Paris, 1819, two vols.).

**Chapter** (chap'ter), one of the chief divisions of a book. As the rules and statutes of ecclesiastical establishments were arranged in chapters, so also the assembly of the members of a religious order, and of canons, was called a *chapter*. The orders of knights used this expression for the meetings of their members, and some societies and corporations call their assemblies *chapters*.

**Chapter-house,** the building attached to a cathedral or religious house in which the chapter meets for the transaction of business. They are of different forms, but are often polygonal in plan. Sometimes they were the burying-place of clerical dignitaries. See *Cathedral.*

**Char,** or CHARR (chär; *Salmo umbla*), a European fresh-water fish of the salmon genus, found plentifully in the deeper lakes of England, Wales, and Ireland, more rarely in those of Scotland. The chars inhabit the colder regions of deep waters, where the temperature is less liable to vary. The body somewhat resembles that of a trout, but is longer and more slender, as well as more brilliant in coloring, with crimson, rose, and white spots; weight sometimes 2 lbs., but generally under 1 lb. Char is much esteemed for the table.

**Characeæ** (ka-rā'se-ē), an order of cryptogamous plants, nearly related to the Algæ, composed of an axis consisting of parallel tubes, which are either transparent or encrusted with carbonate of lime, inhabiting stagnant water, both fresh and salt, beneath which they are always submersed. They are most common in the temperate zone, and emit an unhealthy, fetid odor.

**Charade** (sha-rād' or sha-rād'), a kind of riddle, the subject of which is a word that is proposed for discovery from an enigmatical description of its several syllables, taken separately as so many individual and significant words. When dramatic representation is used to indicate the meaning of the syllables and the whole word it is called an acting charade.

**Charadrius** (ka-ra'dri-us), the genus to which the plover belongs, forming the type of the family Charadriadæ, which includes also the lapwings, pratincoles, oyster-catchers, turnstones, sanderlings, etc.

**Charas** (cha'ras). See *Charras*.

**Charcoal** (chär'kōl), a term applied to an impure variety of carbon, especially such as is produced by charring wood. One kind of it is also obtained from bones (see *Bone-black*); lampblack and coke are also varieties. Wood charcoal is prepared by piling billets of wood in a pyramidal form, with vacuities between them for the admission of air, and causing them to burn slowly under a covering of earth. In consequence of the heat, part of the combustible substance is consumed, part is volatilized, together with a portion of water, and there remains behind the carbon of the wood, retaining the form of the ligneous tissue. Another process consists in heating the wood in close vessels, by which the volatile parts are driven off, and a charcoal remains in the retorts, not so dense as that obtained by the other process. Wood charcoal, well prepared, is of a deep-black color, brittle and porous, tasteless and inodorous. It is infusible in any heat a furnace can raise; but by the intense heat of an electric furnace it is hardened, and at length is volatilized, presenting a surface with a distinct appearance of having undergone fusion. Charcoal is insoluble in water, and is not affected by it at low temperatures; hence, wooden stakes which are to be immersed in water are often charred to preserve them, and the ends of posts stuck in the ground are also thus treated. Owing to its peculiarly porous texture, charcoal possesses the property of absorbing a large quantity of air or other gases at common temperatures, and of yielding the greater part of them when heated. Charcoal likewise absorbs the odoriferous and coloring principles of most animal and vegetable substances, and hence is a valuable deodorizer and disinfectant. Water which, from having been long kept in wooden vessels, as during long voyages, has acquired an offensive smell, is deprived of it by filtration through charcoal powder. Charcoal can even remove or prevent the putrescence of animal matter. It is used as fuel in various arts, where a strong heat is required, without smoke, and in various metallurgic operations. By cementation with charcoal, iron is converted into steel. It is used in the manufacture of gunpowder. In its finer state of aggregation, under the form of ivoryblack, lampblack, etc., it is the basis of black paint; and mixed with fat oils and resinous matter, to give a due consistence, it forms the composition of printing-ink.

**Chard** (chärd), the leaves of artichoke covered with straw in order to blanch them and make them less bitter.—*Beet chards*, the leaf-stalks and midribs of a variety of white beet in which these parts are greatly developed, dressed for the table.

**Chardin** (shär-daṇ), JOHN, son of a Protestant jeweler in Paris, and a jeweler himself, was born in 1643. Sent by his father to the East Indies to buy diamonds, Chardin resided a number of years in Persia and India, and latterly published an account of his travels. He settled in London in 1681, was knighted by Charles II, was envoy to Holland for several years, and died in 1713.

**Charente** (shä-rāṇt), a river in Western France, rising in the department of Haute-Vienne, and falling into the sea about 8 miles below Rochefort, opposite to the isle of Oleron, after a course of about 200 miles. It gives its name to two departments.—CHARENTE, an inland department, formed chiefly out of the ancient province of Angoumois, and traversed by the river Charente; area, 2294 sq miles; capital Angoulême. soil generally thin, dry, and arid; one-third devoted to tillage, a third to vineyards, and the remainder meadows, woods, and waste lands. The wines are of inferior quality, but they yield the best brandy in Europe, the celebrated cognac brandy being made in Cognac and other districts. Pop. 351,733.—CHARENTE-INFÉRIEURE (aṇ-fā-ri-*eur*; 'Lower Charente'), a maritime department, comprises parts of the former provinces of Angoumois and Poitou; area, 2791 sq. miles. Surface in general flat; soil chalky and sandy, fertile, and well cultivated; a considerable portion planted with vines; salt marshes along the coast. The pastures are good, and well stocked with cattle, horses, and sheep. The wine is of common quality, and chiefly used for making brandy. Oysters and sardines

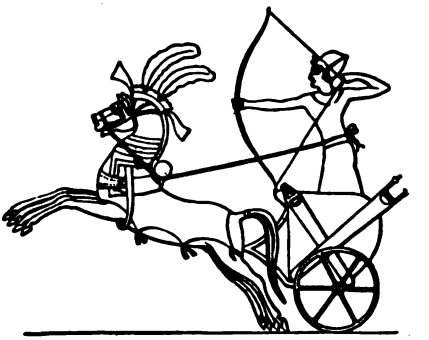
abound on the coast. Salt and brandy are the only articles manufactured to any great extent. Capital La Rochelle. Pop. 453,793.

**Charenton-le-Pont** (shâ-răn-tōn-l-pōn), town about 5 miles east from Paris, at the confluence of the Marne with the Seine, with numerous mercantile and manufacturing establishments. Pop. 18,034.

**Charge** (charj), in heraldry, signifies the various figures depicted on the escutcheon.—In gunnery *charge* signifies the quantity of powder used at one discharge of a gun.—*Charge*, in military tactics, is the rapid advance of infantry or cavalry against the enemy, with the object of breaking his lines by the momentum of the attack. Infantry generally advance to about 100 yards and fire, then gradually quicken their pace into the charge-step, and dash at the enemy's lines. Cavalry charge in echelon or column against infantry, which is usually formed in squares to receive them.

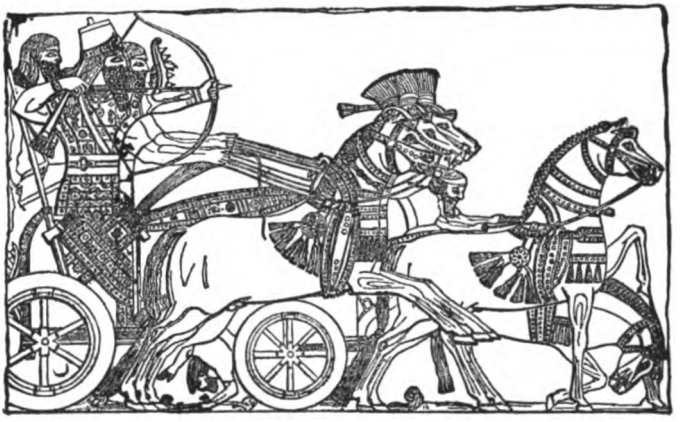
**Chargé-d'Affaires** (shăr-zh ā-d â f-ār), the title of an inferior rank of diplomatic agents. See *Minister, Foreign*.

for pleasure and in war. Chariots, such as those used among the Egyptians, Assyrians, Greeks, and Romans, were of various forms. A common form was open



Egyptian War-chariot.—Rosellini.

behind and closed in front, and had only two wheels. The chariot was strongly and even elegantly built, but not well adapted for speed. In ancient warfare chariots were of great importance; thus we read of the 900 iron chariots of Sisera



Assyrian War-chariot.—Layard

**Charikar** (char-i-kăr'), a town of Afghanistan, in the district of Kohistan, 21 miles north of Cabul. Pop. 5000.

**Charing-Cross** (chăr'ing-kros), the titular center of London, so named from a cross which stood until 1647 at the village of Charing in memory of Eleanor, wife of Edward I. It is now a triangular piece of roadway at Trafalgar Square.

**Chariot** (char'i-ot), a term applied to vehicles used anciently both

as giving him a great advantage against the Israelites. The Philistines in their war against Saul had 30,000 chariots. The sculptures of ancient Egypt show that the chariots formed the strength of the Egyptian army, these vehicles being two-horsed and carrying the driver and the warrior, sometimes a third man, the shield-bearer. There is no representation of Egyptian soldiers on horseback, and consequently when Moses in his song of triumph over Pharaoh speaks of the 'horse and his rider,' 'rider' must be un-

derstood to mean chariot-rider. In the Egyptian chariots the framework, wheels, pole, and yoke were of wood, and the fittings of the inside, the bindings of the framework, as well as the harness were chiefly of raw hide or of tanned leather. We have also numbers of sculptures which give a clear idea of the Assyrian chariots. These resembled the Egyptian in all essential features, containing almost invariably three men—the warrior, the shield-bearer, and the charioteer. A peculiarity of both is the quiver or quivers full of arrows attached to the side. The Assyrian war-chariot shown in the figure is drawn by three horses abreast, and all the appointments are rich and elaborate. It has, as will be noticed, two quivers crossing each other on the side, filled with arrows, and each also containing a small ax. A socket for holding the spear is also attached. From the front of the chariot a singular ornamental appendage stretches forward. War chariots had sometimes scythe-like weapons attached to each extremity of the axle, as among the ancient Persians and Britons. Among the Greeks and Romans chariot races were common.

**Charites** (kar'i-tēz), the Greek name of the Graces.

**Charity,** Sisters of. See *Sisters of Charity.*

**Charkov** (*h*ar'kof). See *Kharkoff.*

**Charlemagne** (shar-lē-mān'; *Carolus Magnus*, Charles the Great), King of the Franks, and subsequently Emperor of the West, was born in 742, probably at Aix-la-Chapelle. His father was Pepin the Short, King of the Franks, son of Charles Martel. On the decease of his father, in 768, he was crowned king, and divided the kingdom of the Franks with his younger brother Carloman, at whose death in 771 Charlemagne made himself master of the whole empire, which embraced, besides France, a large part of Germany. His first great enterprise was the conquest of the Saxons, a heathen nation living between the Weser and the Elbe, which he undertook in 772; but it was not till 803 that they were finally subdued, and brought to embrace Christianity. While he was combating the Saxons, Pope Adrian implored his assistance against Desiderius, King of the Lombards. Charlemagne immediately marched with his army to Italy, took Pavia, overthrew Desiderius, and was crowned King of Lombardy with the iron crown. In 778 he repaired to Spain to assist a Moorish prince, and while returning his troops were surprised in the valley of Roncesvalles by the Biscayans, and the rear-guard defeated; Roland, one of the most famous warriors of those times, fell in the battle. As his power increased, he meditated more seriously the accomplishment of the plan of his ancestor, Charles Martel, to restore the Western Empire of Rome. Having gone to Italy to assist the pope, on Christmas-day 800 he was crowned and proclaimed Cæsar and Augustus by Leo III, the titles of the Roman emperors being thus restored. His son Pepin, who had been made King of Italy, died in 810, and his death was followed the next year by that of Charles, his eldest son. Thus of his legitimate sons one only remained, Louis, King of Aquitania, whom Charlemagne adopted as his colleague in 813. He died Jan. 28, 814, in the forty-seventh year of his reign, and was buried at Aix-la-Chapelle, his favorite and usual place of residence. Charlemagne was a friend of learning, and deserves the name of restorer of the sciences and teacher of his people. He attracted by his liberality the most distinguished scholars to his court (among others, Alcuin, from England), and established an academy in his palace at Aix-la-Chapelle, the sittings of which he attended with all the scientific and literary men of his court. He invited teachers of language and mathematics from Italy to the principal cities of the empire, and founded schools of theology and the liberal sciences in the monasteries. He strove to cultivate his mind by intercourse with scholars; and, to the time of his death, this intercourse remained his favorite recreation. His mother-tongue was a form of German, but he spoke several languages readily, especially the Latin, and was naturally eloquent. He sought to improve the liturgy and church music, and attempted unsuccessfully to introduce uniformity of measures and weights. He built a lighthouse at Boulogne, constructed several ports, encouraged agriculture, and enacted wise laws. He convened councils and parliaments, published capitularies, wrote many letters (some of which are still extant), a grammar, and several Latin poems. His empire comprehended France, most of Catalonia, Navarre, and Aragon, the Netherlands, Germany as far as the Elbe, Saale, and Eider, Upper and Middle Italy, Istria, and a part of Sclavonia. In private life Charlemagne was exceedingly amiable; a good father, and generous friend. In dress and habits he was plain and economical. His only excess was his love of the other sex. In person he was strong and of great stature. He was succeeded by his son Louis (le Débonnaire).

**Charlemont** (shärl-mōn). See *Givet.*

**Charleroi** (shärl-rwä), a town in Belgium, province of Hainaut, on both sides of the river Sambre, 20 miles E. N. E. Mons. It has manufactures of glass, ironware, etc., and woolen stuffs. Pop. 26,528.

**Charleroi** (shär-le-roi'), a town of Washington Co., Pennsylvania, 40 miles E. by S. of Pittsburgh. It has coaling industries, plate-glass and bottling works, etc. Pop. 9615.

**Charles I,** Emperor of Austria and King of Hungary, born in 1887, was the grandson of Archduke Charles Louis, brother of the Emperor Francis Joseph. On the death of the latter without direct heirs, November 21, 1916, Charles succeeded to the throne.

**Charles I,** surnamed *le Chauve,* or *the Bald,* King of France, was son of Louis de Débonnaire, and was born 823. After his father's death in 840 he fought with his half-brother Lothaire for the empire of the Franks, and finally acquired by the Treaty of Verdun (843) all those territories between the ocean on the one side, and the Meuse, the Scheldt, the Saône, the Rhone, and the Mediterranean, on the other. But he lost Southern Aquitaine to his nephew Pepin, and had to divide Lorraine with his brother Louis the German. In 875 he was crowned emperor by Pope John VIII. He died in 877.

**Charles II,** surnamed *le Gros,* or *the Fat,* King of France, is also known as Charles III, Emperor of Germany, and was born about 832. He was the son of Louis the German, and ascended the French throne in 885 to the prejudice of his cousin, Charles the Simple, but was deposed in 887 and died the following year.

**Charles III,** King of France, surnamed *the Simple,* was the son of Louis the Stammerer, and born in 879. His reign is noted for his long struggle with the piratical Northmen or Normans. He died in 929.

**Charles IV,** King of France, surnamed *le Bel,* or *the Handsome,* third son of Philippe le Bel, was born in 1294, and ascended the throne in 1322. He died in 1328, without male issue, and was the last of the direct line descended from Hugh Capet.

**Charles V,** surnamed *the Wise,* King of France, was the son of John II. and was born in 1337. His father being taken prisoner by the English at Poitiers in 1356, the management of the kingdom devolved on him at an early age. With great skill and energy, not free, however, from duplicity, he suppressed the revolt of the Parisians and a rising of the peasants, kept the King of Navarre at bay, and deprived the English of a great part of their dominion in France. He died in 1380. He erected the Bastille for the purpose of overawing the Parisians.

**Charles VI,** surnamed the *Silly,* King of France and son of the foregoing, was born at Paris in 1368, and in 1388 took the reins of government into his own hands. Four years later he lost his reason, and one of the most disastrous periods of French history began. The kingdom was torn by the rival factions of Burgundians and Armagnacs (Orleanists). In 1415 Henry V of England crossed over to Normandy, took Harfleur by storm, won the famous victory of Agincourt, and compelled the crazy king to acknowledge him as his successor. Charles died in 1422.

**Charles VII,** King of France, was born at Paris in 1403. He succeeded only to the southern provinces of the kingdom, Henry VI of England being proclaimed king of France at Paris. The English dominion in France was under the government of the Duke of Bedford, and so skillfully did the English general conduct his operations that Charles had almost abandoned the struggle as hopeless when the appearance of Jeanne d'Arc, the *Maid of Orleans,* gave, as if by a miracle, a favorable turn to his affairs, and the struggle ended in the expulsion of the English from all their possessions in France except Calais. Charles died in 1461.

**Charles VIII,** King of France, son of Louis XI, was born in 1470, and succeeded his father in 1483. In 1491 he married Anne, the heiress of Brittany, and thereby annexed that important duchy to the French crown. The chief event in the reign of Charles VIII is his expedition into Italy, and rapid conquest of the kingdom of Naples, a conquest as rapidly lost when a few months later Gonsalvo de Cordova reannexed it to Spain. Charles was meditating a renewed descent into Italy when he died in 1498.

**Charles IX,** King of France, son of Henry II and Catharine de' Medici, born in 1550, ascended the throne at the age of ten years. His haughty and ambitious mother seized the control of the state. Along with the Guises she headed the Catholic League against the Calvinists, and her tortuous and unscrupulous policy helped to embitter the religious strife of the factions. After a series of Huguenot persecutions and civil wars a peace was made in

1570, which, two years later, on 24th August, 1572, was treacherously broken by the *Massacre of St. Bartholomew*. The king, who had been little more than the tool of his scheming mother, died two years afterwards, in 1574.

**Charles X,** King of France, Comte d'Artois, born at Versailles in 1757, grandson of Louis XV, was the youngest son of the dauphin, and brother of Louis XVI. He left France in 1789, after the first popular insurrection and destruction of the Bastille, and afterwards assuming the command of a body of emigrants, acted in concert with the Austrian and Prussian armies on the Rhine. Despairing of success, he retired to Great Britain and resided for several years in the palace of Holyrood at Edinburgh. He entered France at the Restoration, and in 1824 succeeded his brother, Louis XVIII, as king. In a short time his reactionary policy brought him into conflict with the popular party, and in 1830 a revolution drove him from the throne. He died in 1836. His grandson, the Comte de Chambord (which see), claimed the French throne as his heir.

**Charles IV,** Emperor of Germany, of the house of Luxemburg, was born 1316, and was the son of King John of Bohemia. In 1346 he was elected emperor by five of the electoral princes, while the actual emperor Louis the Bavarian was still alive. On the death of the latter a part of the electors elected Count Gunther of Schwarzburg, who soon after died; and Charles at length won over his enemies, and was elected and consecrated emperor at Aix-la-Chapelle. In 1354 he went to Italy and was crowned King of Italy at Milan, and emperor at Rome the year following. On his return to Germany in 1356 Charles issued his *Golden Bull* (which see) regulating the election of the German emperors. He died at Prague in 1378. Charles was artful, but vacillating, and careless of all interests but those of his own family and his hereditary kingdom of Bohemia. In Germany bands of robbers plundered the country, and the fiefs of the empire were alienated. In Italy Charles sold states and cities to the highest bidder, or if they themselves offered most, made them independent republics. But Bohemia flourished during his reign. He encouraged trade, industry, and agriculture, made Prague a great city, and established there the first German university (1348).

**Charles V,** Emperor of Germany and King of Spain (in the latter capacity he is called Charles I), the eldest son of Philip, Archduke of Austria, and of Joanna, the daughter of Ferdinand and Isabella of Spain, was born at Ghent, Feb. 24, 1500. Charles was thus the grandson of the Emperor Maximilian and Mary, daughter of Charles the Bold, last Duke of Burgundy, and inherited from his grandparents on both sides the fairest countries in Europe, Aragon, Naples, Sicily, Sardinia, Castile, and the colonies in the New World, Austria, Burgundy, and the Netherlands. On the death of Ferdinand, his grandfather, Charles, assumed the title of King of Spain. In 1519 he was elected emperor, and was crowned at Aix-la-Chapelle with extraordinary splendor. The progress of the Reformation of Germany demanded the care of the new emperor, who held a diet at Worms. Luther, who appeared at this diet with a safe-conduct from Charles, defended his case with

Charles V of Germany.

energy and boldness. The emperor kept silent; but after Luther's departure a severe edict appeared against him in the name of Charles, who thought it his interest to declare himself the defender of the Roman Church. A war with France, which the rival claims of Francis I in Italy, the Netherlands, and Navarre made inevitable, broke out in 1521. Neither side had a decided success till the battle of Pavia in 1525, where Francis was totally defeated and taken prisoner. Charles treated his captive with respect, but with great rigor as regarded the conditions of his release. A league of Italian states, headed by Pope Clement VII, was now formed against the overgrown power of Charles; but their ill-directed efforts had no success. Rome itself was stormed and pillaged by the troops of the Constable of Bourbon, and the pope made prisoner. Nor was the alliance of Henry VIII of England with

Francis against the emperor any more successful, the war ending in a treaty (Cambray, 1529) of which the conditions were favorable to Charles. A war against the Turks by which Solyman was compelled to retreat, and an expedition against the Dey of Tunis by which 20,000 Christian slaves were released, added to the influence of Charles, and acquired for him the reputation of a chivalrous defender of the faith. In 1537 he made truce with Francis, and soon after, while on his way to the Netherlands, spent six days at the court of the latter in Paris. In 1541 another expedition against the African Moors, by which Charles hoped to crown his reputation, was unsuccessful, and he lost a part of his fleet and army before Algiers without gaining any advantage. A new war with France arose regarding the territory of Milan. The quarrel was patched up by the peace of Crespy in 1545. The religious strife was again disturbing the emperor. Charles, who was no bigot, sought to reconcile the two parties, and with this view alternately courted and threatened the Protestants. At length in 1546 the Protestant princes declared war, but were driven from the field and compelled to submit. But the defection of his ally, Maurice of Saxony, whom Charles had invested with the electoral dignity, again turned the tide in favor of the Protestants. Maurice surprised the imperial camp at Innsbruck in the middle of a stormy night, and Charles with great difficulty escaped alone in a litter. The Treaty of Passau was dictated by the Protestants. It gave them equal rights with the Catholics, and was confirmed three years later by the diet of Augsburg (1555). Foiled in his schemes and dejected with repeated failures, Charles resolved to resign the imperial dignity, and transfer his hereditary estates to his son Philip. In 1555 he conferred on him the sovereignty of the Netherlands, and on January 15, 1556, that of Spain, retiring himself to a residence beside the monastery of Yuste in Estremadura, where he amused himself by mechanical labors and the cultivation of a garden. He still took a strong interest in public affairs, though in his later years he was very much of an invalid, his ill health being partly caused by his gourmandizing habits. He died on Sept. 21, 1558.

**Charles VI,** German emperor, the second son of the Emperor Leopold I, was born Oct. 1, 1685. He was destined, according to the ordinary rules of inheritance, to succeed his relative Charles II on the throne of Spain. But Charles II by his will made a French prince, Philip, Duke of Anjou, grandson of Louis XIV, heir to the Spanish monarchy. This occasioned the war of the Spanish Succession, in which England and Holland took the part of the Austrian claimant. Charles held possession of Madrid for a time, and was supported by the skill of Marlborough and Eugene, but he was eventually obliged to resign Spain to the French claimant, and. content himself with the Spanish subject-lands, Milan, Mantua, Sardinia, and the Netherlands (Treaty of Utrecht, 1713, and Treaty of Rastadt, 1714). He became emperor in 1711. In a war against the Turks his armies, led by Eugene of Savoy, gained the decisive victories of Peterwardein and Belgrade. After the death of his only son, Charles directed all his policy and energies to secure the guarantee of the various powers to the Pragmatic Sanction, which settled the succession to the Austrian dominions on his daughter Maria Theresa. In 1733 a war with France and Spain regarding the succession in Poland terminated unfavorably for him, he having to surrender Sicily, Naples, and part of Milan to Spain, and Lorraine to France. In 1727 he renewed the war with the Turks, this time unsuccessfully. Charles died Oct. 20, 1740.

**Charles VII,** Emperor of Germany, born in 1697, was the son of Maximilian Emanuel, elector of Bavaria. In 1726 he succeeded his father as Elector of Bavaria. He was one of the princes who protested against the Pragmatic Sanction, and after the death of Charles VI (see above), in 1740, he refused to acknowledge Maria Theresa as heiress. In support of his own claims he invaded Austria with an army, took Prague, was crowned King of Bohemia, and in 1742 was elected emperor. But fortune soon deserted him. The armies of Maria Theresa reconquered all Upper Austria, and overwhelmed Bavaria. Charles fled to Frankfort, and returning to Munich in 1744, died there the following year.

**Charles I,** King of England, Scotland, and Ireland, was born at Dunfermline, Scotland, in the year 1600, and was the third son of James VI and Anne of Denmark. He married Henrietta Maria, daughter of Henry IV of France, and in 1625 succeeded to the throne, receiving the kingdom embroiled in a Spanish war. The first parliament which he summoned, being more disposed to state grievances than grant supplies, was dissolved. Next year (1626) a new parliament was summoned; but the House proved no more

tractable than before, and was soon dissolved. In 1628 the king was obliged to call a third parliament, which showed itself as much opposed to arbitrary measures as its predecessor, and after voting the supplies prepared the *Petition of Right*, which Charles was constrained to pass into a law. But the determined spirit with which the parliament resisted

**Charles I of England.**

the king's claim to levy tonnage and poundage on his own authority led to a rupture, and Charles again dissolved the parliament, resolving to try and reign without one. In this endeavor he was supported by Strafford and Laud as his chief counselors. With their help Charles continued eleven years without summoning a parliament, using the arbitrary courts of High Commission and Star-chamber as a kind of cover for pure absolutism, and raising money by unconstitutional or doubtful means. In 1637 John Hampden began his career of resistance to the king's arbitrary measures by refusing to pay ship-money, the right to levy which, without authority of parliament, he was determined to bring before a court of law. His cause was argued for twelve days in the Court of Exchequer; and although he lost it by the decision of eight of the judges out of twelve, the discussion of the question produced a very powerful impression on the public mind. It was in Scotland, however, that formal warlike opposition was destined to commence. The attempts of Charles to introduce an Anglican liturgy into that country produced violent tumults, and gave origin to the famous *Covenant* in 1638, to oppose the king's design. An English army was sent north, but was defeated by the army of the Covenanters, and in 1640 a parliament was again summoned, which proved to be the famous Long Parliament. An account of the struggle between king and parliament, the trial and execution of Strafford and Laud, etc., cannot here be given, but the result was that both king and parliament made preparations for war. The king had on his side the great bulk of the gentry, while nearly all the Puritans and the inhabitants of the great trading towns sided with the parliament. The first action, the battle of Edgehill (23d Oct., 1642), gave the king a slight advantage; but nothing very decisive happened till the battle of Marston Moor, in 1644 where Cromwell routed the royalists. The loss of the battle of Naseby, the year following, completed the ruin of the king's cause. Charles at length gave himself up to the Scottish army at Newark (5th May, 1646). After some negotiations he was surrendered to the commissioners of the parliament. The extreme sect of the Independents, largely represented in the army and headed by Cromwell, now got the upper hand, and, coercing the parliament and the more hesitating of the Presbyterians, brought Charles to trial for high treason against the people, and had sentence of death pronounced against him. All interposition being vain, he was beheaded before the Banqueting House, Whitehall, on 30th Jan., 1649, meeting his fate with great dignity and composure. Charles had many good qualities. Possessed of a highly-cultivated mind, with a fine judgment in arts and letters, he was also temperate, chaste, and religious, and, although somewhat cold in his demeanor, kind and affectionate. Nor was talent wanting to him. But these merits were counterbalanced and all but neutralized by a want of self-reliance and a habit of vacillation, which in his position had the effect of insincerity. Coupled with this was a temperament which would not brook control and tended to absolutism.

**Charles II,** King of England, Ireland, and Scotland, son of Charles I and Henrietta Maria of France, was born in 1630. He was a refugee at The Hague on the death of his father, on which he immediately assumed the royal title. Cromwell was then all-powerful in England; but Charles accepted an invitation from the Scots, who had proclaimed him their king July, 1650, and, passing over to Scotland, was crowned at Scone (1651). Cromwell's approach made him take refuge among the English royalists, who, having gathered an army, encountered Cromwell at Worcester and were totally defeated. With great difficulty Charles escaped to

France. On the death of Cromwell the Restoration effected without a struggle by General Monk set Charles on the throne after the declaration of Breda, his entry into the capital (29th May, 1660) being made amidst universal acclamations. In 1662 he married the Infanta of Portugal, Catharine of Braganza, a prudent and virtuous princess, but in no way calculated to acquire the affection of a man like Charles. For a time his measures, mainly counseled by the chancellor, Lord Clarendon, were prudent and conciliatory. But the indolence, extravagance, and licentious habits of the king soon involved the nation as well as himself in difficulties. Dunkirk was sold to the French to relieve his pecuniary embarrassment, and war broke out with Holland. A Dutch fleet entered the Thames, and burned and destroyed ships as far up as Chatham. The great plague in 1665, and the great fire of London the year following, added to the disasters of the period. In 1667 Clarendon was dismissed, and a triple alliance between England, Holland, and Sweden, for the purpose of checking the ambition of Louis XIV, followed; but the extravagance of the king made him willing to become a mere pensioner of Louis XIV, with whom he arranged a private treaty against Holland in 1670. The *Cabal* ministry was by this time in power, and they were quite ready to break the triple alliance and bring about a rupture with the Dutch. As the king did not choose to apply to parliament for money to carry on the projected war, he caused the exchequer to be shut up in January, 1672, and by several other disgraceful and arbitrary proceedings gave great disgust and alarm to the nation. The war ended in failure, and the Cabal ministry was dissolved in 1673. The year 1678 was distinguished by the pretended Popish plot of Titus Oates, which led to the exclusion of Roman Catholics from parliament. In 1679 the Habeas Corpus Act was passed, and the temper of the parliament was so much excited that the king dissolved it. A new parliament which assembled in 1680 had to be dissolved for a like reason, and yet another which met the year following at Oxford. Finally Charles, like his father, determined to govern without a parliament, and after the suppression of the Rye House plot and the execution of Russell and Sidney re-established an absolute rule. He died from the consequences of an apoplectic attack in February, 1685, after having received the sacrament according to the rites of the Roman Church. Charles was a man of wit, and possessed an easy good nature, but was entirely selfish, and indifferent to anything but his own pleasure. He had no patriotism, honor, or generosity, but was not destitute of the ability to rule. He had no legitimate children. His mistresses were numerous, and several of them were raised to the highest ranks of nobility, while six of his illegitimate sons were made dukes.

**Charles XII,** King of Sweden, was born at Stockholm, June 27, 1682. On the death of his father, in 1697, when he was but fifteen years old, he was declared of age by the estates. To his jealous neighbors this seemed a favorable time to humble the pride of Sweden. Frederick IV of Denmark, Augustus II of Poland, and the Czar Peter I of Russia concluded an alliance which resulted in war against Sweden. With the aid of an English and Dutch squadron the Danes were soon made to sign peace, but Augustus of Saxony and Poland, and the czar were still in the field. Rapidly transporting 20,000 men to Livonia, Charles stormed the czar's camp at Nerva, slaying 30,000 Russians and dispersing the rest (30th Nov., 1700). Crossing the Dwina he then attacked the Saxons and gained a decisive victory. Following up this advantage he won the battle of Clissau, drove Augustus from Poland, had the crown of that country conferred on Stanislaus Leczinsky, and dictated the conditions of peace at Altranstadt in Saxony in 1706. In September, 1707, the Swedes left Saxony to invade Russia, Charles taking the shortest route to Moscow. At Smolensk he altered his plan, deviated to the Ukraine to gain the help of the Cossacks, and weakened his army very seriously by difficult marches through a district extremely cold and ill supplied with provisions. In this condition Peter marched upon him with 70,000 men, and defeated him completely at Pultawa. Charles fled with a small guard and found refuge and an honorable reception at Bender, in the Turkish territory. Here he managed to persuade the Porte to declare war against Russia. The armies met on the banks of the Pruth (July 1, 1711) and Peter seemed nearly ruined, when his wife, Catharine, succeeded in bribing the grand vizier, and procured a peace in which the interests of Charles were neglected. The attempts of Charles to rekindle a war were vain, and after having spent some years at Bender he was forced by the Turkish government to leave. Arrived in his own country in 1714, he set about the measures necessary to defend the kingdom, and the fortunes of Sweden were beginning to assume a favorable aspect

when he was slain by a cannonball as he was besieging Frederikshall, Norway, Nov. 30, 1718. Firmness, valor, and love of justice were the great features in the character of Charles, with which were combined a remarkable military genius and a desire to emulate the career of Alexander the Great. But his rashness and obstinacy were such as to negative the effect of his high powers. After his death Sweden sank from the rank of a leading power. Voltaire's *Life of Charles XII* gives a picturesque account of his career.

**Charles XIII,** King of Sweden, was born in 1748, being the second son of King Adolphus Frederick. In the war with Russia, in 1788, he received the command of the fleet, and defeated the Russians in the Gulf of Finland. After the murder of his brother, Gustavus III, in 1792, he was placed at the head of the regency, and gained universal esteem in that position. The revolution of 1809 placed him on the throne at a very critical period, but his prudent conduct procured the union of Sweden with Norway, Nov. 4, 1814. He adopted as his successor Marshal Bernadotte, who became king on the death of Charles, Feb. 5, 1818.

**Charles XIV.** See *Bernadotte.*

**Charles I,** King of Spain. See *Charles V, Emperor of Germany.*

**Charles IV,** King of Spain, born at Naples 12th Nov., 1784, succeeded his brother Ferdinand VI in 1788, was all his life completely under the influence of his wife and her paramour Godoy. In 1808 Charles abdicated in favor of Napoleon. He died in 1819.

**Charles I,** King of Roumania, was born in 1839, son of the German Prince Karl Anton of Hohenzollern-Sigmaringen. He was elected Prince of Roumania in 1866 and was crowned king in 1881, following the Russo-Turkish war. His wife, Elizabeth, daughter of Prince Herman of Wied, became a notable author under the pen name of Carmen Sylva. On the outbreak of the European war he maintained the neutrality of Roumania and kept in close touch with the Triple Alliance. He died on October 10, 1914, and was succeeded by his nephew, Prince Ferdinand of Hohenzollern-Sigmaringen, in default of direct heirs.

**Charles,** ARCHDUKE OF AUSTRIA, third son of the Emperor Leopold II, was born in Florence 5th Sept., 1771. Commander-in-chief of the Austrian army on the Rhine, he won several victories against the French. In 1805 he commanded in Italy against Masséna, and won Caldiero (31st Oct.); but in the campaign of 1809 in Germany against Napoleon he was unsuccessful, the battle of Wagram (5th and 6th July) laying Austria at the feet of the French emperor. With that event the military career of Charles closed. He died in 1847. He published several military works of value.

**Charles Albert,** King of Sardinia, born 1798, was the son of Charles Emmanuel, Prince of Savoy-Carignan. In 1831 he succeeded to the throne on the death of Charles Felix, but his government at first greatly disappointed the liberal party by its despotic tendencies. It was not till near 1848 that, seeing the growing strength of the progressive and national movement in Italy, he took up the position of its champion. As such he took the field against Austria on behalf of the Lombardo-Venetian provinces, but was crushingly defeated at Novara, 23d March, 1849. He abdicated in favor of his son, Victor Emmanuel, and, retiring to Portugal, died 28th July, 1849.

**Charles Edward Stuart,** called the *Pretender*, grandson of James II, King of England, son of James Edward and Clementina, daughter of Prince Sobieski, was born in 1720 at Rome. In 1742 he went to Paris and persuaded Louis XV

Prince Charles Edward Stuart.

to assist him in an attempt to recover the throne of his ancestors. Fifteen thousand men were on the point of sailing from Dunkirk, when the English admiral Norris dispersed the whole fleet. Charles now determined to trust to his own exertions. Accompanied by seven officers he landed on the west coast of Scotland,

from a small ship called the *Doutelle*. Many Lowland nobles and Highland chiefs went over to his party. With a small army thus formed he marched forward, captured Perth, then Edinburgh (Sept. 17, 1745), defeated an army of 4000 British under Sir John Cope at Prestonpans (Sept. 22), and advancing obtained possession of Carlisle. He now caused his father to be proclaimed King and himself Regent of England; removed his headquarters to Manchester, and soon found himself within 100 miles of London, where many of his friends awaited his arrival. The rapid successes of the adventurer now caused a part of the British forces in Germany to be recalled. Want of support, disunion, and jealousy among the adherents of the house of Stuart, some errors, and the superior force opposed to him, compelled Prince Charles to retire in the beginning of 1746. The victory at Falkirk (Jan. 28, 1746) was his last. As a final attempt he risked the battle of Culloden against the Duke of Cumberland, April 16, 1746, in which his army was defeated and entirely dispersed. The prince now wandered about for a long time through the wilds of Scotland, often without food, and the price of £30,000 sterling was set upon his head. At length, on Sept. 20, 1746, five months after the defeat of Culloden, he escaped in a French frigate. He received a pension of 20,000 livres yearly from France, and of 12,000 doubloons from Spain. Forced to leave France by the terms of the Peace of Aix-la-Chapelle (1748), he went to Italy, and in 1772 married a princess of Stolberg-Gedern, from whom eight years later he was separated. (See *Albany*.) In the end he fell into habits of intoxication, died Jan. 31, 1788, and was buried at Frascati. The funeral service was performed by his only surviving brother, the Cardinal of York, with whose death in 1807 the Stuart line ended. The cardinal received a pension from Britain of £4000 a year till his death.

**Charles Martel'**, ruler of the Franks, was a son of Pepin Héristal. His father had governed as mayor of the palace under the weak Frankish kings with so much justice that he was enabled to make his office hereditary in his family. Chilperic II, king of the Franks, refusing to acknowledge Charles Martel as mayor of the palace, the latter deposed him, and set Clothaire IV in his place. After the death of Clothaire he restored Chilperic, and subsequently placed Thierri on the throne. Charles Martel rendered his rule famous by the great victory which he gained in October, 732, over the Saracens, near Tours, from which he acquired the name of *Martel*, signifying *hammer*. He died 741. Charlemagne was his grandson. See *Charlemagne*.

**Charles the Bold,** Duke of Burgundy, son of Philip the Good and Isabella of Portugal, born at Dijon Nov. 10, 1433. While his father yet lived Charles left Burgundy, and forming an alliance with some of the great French nobles for the purpose of preserving the power of the feudal nobility, he marched on Paris with 20,000 men, defeated Louis XI at Montlhéri, and won the counties of Boulogne, Guines, and Ponthieu. Succeeding his father in 1467, he commenced his reign by severe repression of the citizens of Liège and Ghent. In 1468 he married Margaret of York, sister of Edward IV of England. Liège having rebelled, the duke stormed and sacked the town. In 1470 the war with France was renewed, and although the duke was forced to sue for a truce he soon took up arms anew, and, crossing the Somme, stormed and fired the city of Nesle. Louis meanwhile involved him in greater embarrassments by exciting against him Austria and the Swiss. Charles, ever ready to take up a quarrel, threw himself on Germany with characteristic fury, and lost ten months in a futile siege of Neuss. He was successful, however, in conquering Lorraine from Duke René. Charles now turned his arms against the Swiss, took the city of Granson, putting 800 men to the sword. But this cruelty was speedily avenged by the descent of a Swiss army, which at the first shock routed the duke's forces at Granson, March 3, 1476. Mad with rage and shame Charles gathered another army, invaded Switzerland, and was again defeated with great loss at Morat. The Swiss, led by the Duke of Lorraine, now undertook the reconquest of Lorraine, and obtained possession of Nancy. Charles marched to recover it, but was utterly routed and himself slain. The house of Burgundy ended in him, and his death without male heirs removed the greatest of those independent feudal lords whose power stood in the way of the growth of the French monarchy. His daughter Mary married Maximilian of Germany, but most of his French territory passed into the hands of the French king.

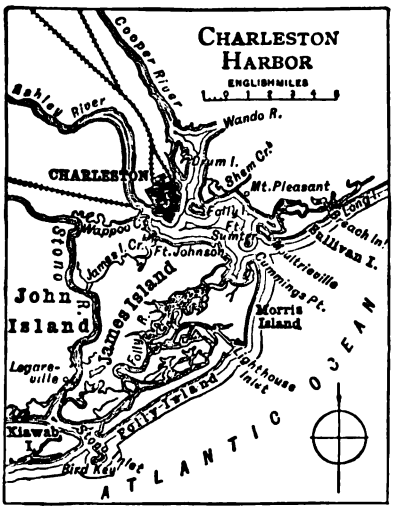
**Charles the Great.** See *Charlemagne*.

**Charles River,** a short river in Massachusetts, which flows into Boston harbor, separating Boston from Charlestown. It affords motive

power for many factories and is navigable for a few miles above Boston.

**Charles's Wain.** See *Bear, Great.*

**Charleston** (Charls'tun), a city and seaport of South Carolina, on a tongue of land formed by the confluence of the rivers Cooper and Ashley, which unite just below the city, and form a spacious and convenient harbor extending about 7 miles to the Atlantic, and defended by several forts. The city is regularly laid out, most of the principal thoroughfares being 60 to 70 feet wide and bordered with fine shade-trees. It has become the metropolis of the state, and is one of the leading commercial cities in the south. Its institutions are numerous, including the Charleston Library, founded in 1743, the College of Charleston, 1785, and the Orphan House, 1794, one of the oldest institutions of its kind in the country. The staple




exports are cotton, rice, rosin and turpentine, lumber, and phosphate (see that art.). It has also important manufacturing industries. The Civil war greatly damaged its trade, but there has since been marked commercial and industrial progress. Yellow fever formerly made frequent ravages in Charleston, but the city is now considered more healthy than most other Atlantic towns in the southern states. It was the scene of the outbreak of the Civil War on April 12, 1861, and was evacuated by the Confederates on February 17, 1865. On 31st August, 1886, the coast region of the United States from Alabama to New York experienced a series of earthquake shocks, from which Charleston in particular suffered severely, many lives and about $5,000,000 worth of property being destroyed. Pop. 70,000.

**Charleston,** city, capital of Coles Co., Illinois, 45 miles w. of Terre Haute. It has flouring and woolen mills, railroad machine shops, etc., and is the seat of the Eastern Illinois State Normal School. Pop. 5884.

**Charleston,** a city and capital of the State of West Virginia, is situated on the Great Kanawha River, which is navigable for steamboats to this point. It is a large oil and coal center and is served by five railroads. There are various industrial plants, including a large axe factory. Pop. 50,000.

**Charlestown,** a former city and seaport of the United States, since 1874 part of the municipality of Boston, with which it is connected by bridges across Charles River. In the southeast part there is one of the chief navy-yards in the United States, occupying an area of from 70 to 80 acres. Bunker Hill, on which was fought one of the most celebrated battles of the American Revolution, is in this town, and there is, on the site, a commemorative monument 220 feet high.

**Charleville** (shârl-vēl), a town of France, department of Ardennes, 1 mile N. of Mézières, with which it communicates by a bridge across the Meuse. It has wide and regular-built streets, considerable manufactures, and a large trade in coal, iron, wine, etc. Pop. 19,693.

**Charlock** (chär'lok), the vulgar name of *Sinapis arvensis*, a common yellow weed in cornfields, also called wild mustard. Jointed or white charlock is *Raphanus Raphanistrum*. It also is a common cornfield weed, but having white or straw-colored flowers and jointed pods.

**Charlotte** (shär'lot), a city of North Carolina, capital of Mecklenburg Co., and the seat of Biddle University and other educational institutions. It has manufactures of cotton, cotton-seed-oil and various others, and is the seat of a branch of the United States mint, not now in operation. Pop. 34,014.

**Charlotte-Amalie,** a town, capital of the Island of St. Thomas, West Indies, one of the Virgin Islands, belonging to the United States, on the S. side of the island. It has an excellent harbor with a floating dock and is an important coaling station. Pop. about 12,000.

**Charlottenburg** (shâr-lot'en-burh), a town of Prussia, on the Spree, about 3 miles from Berlin, with a royal palace and park, many beautiful villas and handsome monuments, also important industrial and manufacturing establishments, especially of electrical appliances. Pop. 237,231.

**Charlottesville** (shâr'lo t s-v i l), a city, capital of Albemarle Co., Virginia, 97 miles W. N. W. of Richmond. It is the seat of the University of Virginia, founded by Thomas Jefferson in 1819, and near by is Monticello, Jefferson's home. It has iron and bottling works, woolen and silk mills, etc. Pop. 6765.

**Charlottetown,** a town of British North America, capital of Prince Edward Island, on Hillsborough Bay, 110 miles N. of Halifax. It contains handsome public buildings and churches, is advantageously situated for commerce, and its harbor is one of the best in North America. Pop. (1911) 11,198.

**Charm,** anything believed to possess some occult or supernatural power, such as an amulet, spell, etc., but properly applied (as the name, derived from Lat. *carmen* a song, indicates) to spells couched in formulas of words or verses.

**Char'nel-house,** a chamber or building under or near churches where the bones of the dead are deposited.

**Charon** (kā'ron), in Greek mythology, the son of Erebus and Night. It was his office to ferry the dead in his crazy boat over the rivers of the infernal regions, for which office he received an obolus, or farthing, which accordingly was usually put into the mouth of the deceased. He was represented as an old man with a gloomy aspect, matted beard, and tattered garments.

**Charpie** (shâr'pē), lint for dressing wounds.

**Charpoy** (shâr'poi), in the East Indies, a small portable bed, consisting of a wooden frame resting on four legs, with bands across to support the bedding.

**Charqui** (chär'kē), jerked beef, the Chilean name of which the English term is a corruption.

**Charr.** See *Char.*

**Charras** (char'ras), a resinous substance which exudes from the Indian hemp and is collected for use as a narcotic or intoxicant, forming a considerable article of trade in Asia.



**Chart,** a hydrographical or marine map, that is a draught or projection of some part of the earth's surface, with the coasts, islands, rocks, banks, channels, or entrances into harbors, rivers, and bays, the points of compass, soundings, or depth of water, etc., to regulate the courses of ships in their voyages. The term *chart* is applied to a marine map; *map* is applied to a draught of some portion of land (often including sea also). And *plane chart* is one in which the meridians are supposed parallel to each other, the parallels of latitude at equal distances, and of course the degrees of latitude and longitude everywhere equal to each other. A great number of excellent charts are produced by the hydrographic department of the British admiralty and are sold at a low rate. The United States Coast Survey Department produces similar charts. See *Map.*

**Charter** (chär'ter), a written instrument, executed with usual forms, given as evidence of a grant, contract, or other important transaction between man and man. *Royal charters* are such as are granted by sovereigns to convey certain rights and privileges to their subjects, such as the Great Charter, granted by King John (see *Magna Charta*), and charters granted by various sovereigns to boroughs and municipal bodies, to universities and colleges, or to colonies and foreign possessions; somewhat similar to which are charters granted by the state or legislature to banks and other companies or associations, etc.

**Charter-house,** a celebrated school and charitable foundation in the city of London. In 1370 Sir Walter Manny and Northburgh, Bishop of London, built and endowed it as a priory for Carthusian monks (hence the name, a corruption of *Chartreuse*, the celebrated Carthusian convent). After the dissolution of the monasteries it passed through several hands till it came into the possession of Thomas Sutton, who converted it into a hospital, richly endowed, consisting of a master, preacher, head schoolmaster, with forty-four boys and eighty decayed gentlemen, together with a physician and other officers and servants of the house. Each boy is educated at a certain expense, and each pensioner receives food, clothing, lodging, and an allowance of about £26 a year. The poor brethren must be over fifty years of age, and members of the Church of England. The school has a high reputation, and many lads are educated there other than the scholars properly so called. Several of the famous men who have

received their education at the Charterhouse are Isaac Barrow, Addison, Steele, John Wesley, Blackstone, Grote, Thirlwall, Havelock, John Leech, and Thackeray.

**Charter-party** is a contract executed by the freighter and the master or owner of a ship containing the terms upon which the ship is hired to freight. The masters and owners usually bind themselves that the goods shall be delivered (dangers of the sea excepted) in good condition. The charterer is bound to furnish the cargo at the place of lading and to take delivery at the port of discharge within specified periods called *lay days*.

**Chartier** (shär-tyā), ALAIN, a French poet and moralist, born, it is supposed, at Bayeux about 1386; died in 1449. His contemporaries considered him the father of French eloquence. His poems are often graceful and nervous, and his vigorous prose contains many fine thoughts and prudent maxims.

**Chartism** (chart'ism), CHARTISTS, name for a political movement and its supporters that formerly caused great excitement in Britain. The reform bill passed in 1832 gave political enfranchisement to the middle classes, but to the large body of the working classes it brought, primarily at least, no additional advantages, and this circumstance was turned to account by many demagogues, who urged on the people the idea that they had been betrayed by the middle classes and their interests sacrificed. A period of commercial depression and a succession of bad harvests brought discontent to a head in the Chartist movement. It was founded on the general idea that the evils under which the people were laboring were due to the misconduct of government and a defective political representation. In 1838 the famous 'Charter,' or 'People's Charter,' was prepared by a committee of six members of parliament and six working men. It comprised six heads, namely:—1. Universal suffrage, or the right of voting for every male of twenty-one years of age. 2. Equal electoral districts. 3. Vote by ballot. 4. Annual parliaments. 5. No other qualification to be necessary for members of parliament than the choice of the electors. 6. Members of parliament to be paid for their services. Immense meetings were now held throughout the country, and popular excitement mounted to the highest pitch. Physical force was advocated as the only means for obtaining satisfaction. In June, 1839, after the refusal of the House of Commons to consider a monster petition in favor of the Charter, serious riots took place. In 1848 the French revolution of February stirred all the revolutionary elements in Europe, and a great demonstration on the part of the Chartists was organized. But the preparations taken by the government for defense prevented outbreaks of any consequence, and Chartism then gradually declined. Some of the demands of the Charter have been adopted by the Liberal party and made into law; while the more advanced section of Chartism has been absorbed by Socialistic and republican movements.

**Chartres** (shärtr), a city of France, capital of the department Eure et-Loire, 49 miles S. W. of Paris. It is a very ancient city; a large number of the houses are built of wood and plaster, and have their gables toward the street. The cathedral, one of the most

The Cathedral, Chartres.

magnificent in Europe, is rendered conspicuous by its two spires surmounting the height on which the city stands. Manufactures: woolen, hosiery, hats, earthenware, and leather; there is a con-

siderable trade. This town was long held by the English, from whom it was taken by Dunois in 1432. Henry IV was crowned here in 1594. Pop. 19,433.

**Chartreuse** (shär-treuz), or GREAT CHARTREUSE, a famous Carthusian monastery in Southeastern France, a little northeast of Grenoble, situated at the foot of high mountains, 3280 feet above sea-level, the headquarters of the order of the Carthusians. It was founded in 1084, but the present building, a huge, plain-looking pile, dates from 1676. The monks of this monastery, expelled in 1903 and since then settled in Spain, manufacture the well-known liquor called *Chartreuse*.

**Chartulary** (char'tū-lar-i), a record or register in which the charters, title-deeds, etc., of any corporation were copied for safety and convenience of reference. They were often kept by private families.

**Charybdis** (ka-rib'dis), an eddy or whirlpool in the Straits of Messina, celebrated in ancient times, and regarded as the more dangerous to navigators because in endeavoring to escape it they ran the risk of being wrecked upon Scylla, a rock opposite.

**Chase** (chās), (1) in printing, an iron frame used to confine types when set in columns or pages. (2) The part of a gun between the trunnions and the swell of the muzzle, or in modern guns, in which the muzzle has no swell, the whole of that part of a gun which is in front of the trunnions.

**Chase,** or CHACE, an open piece of ground stored with wild beasts or game, and belonging to a private proprietor. It differs from a forest, which is not private property and is invested with privileges, and from a park, which is enclosed.

**Chase,** SALMON PORTLAND, statesman and jurist, born in New Hampshire, in 1808. Having adopted the law as his profession, he settled at Cincinnati and acquired a practise there. He early showed himself an opponent of slavery, and was the means of founding the Free-soil party, which in time gave rise to the great Republican party—the power that brought the downfall of slavery. In 1849–55 he was a member of the United States Senate, in which he vigorously opposed the extension of slavery into the new territories. In 1855 he was elected governor of Ohio, being re-elected in 1857. In 1860 he was an unsuccessful candidate for the presidency. In 1861 he was appointed secretary of the treasury in Lincoln's cabinet and in this post was signally successful in providing funds for carrying on the Civil war. In 1864 he resigned office, and was appointed chief-justice of the supreme court. He died in 1873.

**Chase,** WILLIAM MERRITT, an American painter, born at Franklin, Indiana, November 1, 1849. He went to Munich in 1872, joining the group of American students afterward known as Munich secessionists, who established the Society of American Artists in New York. He soon became noted for his brilliant paintings, especially his portraits and figure pieces. He was also active as an instructor and lecturer. He was elected a member of the National Academy, 1890.

**Chasidim** (*ḥas'i-dēm*), or PIETISTS, the name of a Jewish sect which appeared in the eighteenth century. Its adherents are strongly inclined to mysticism, depreciate the Old Testament and its ordinances, believe in extraordinary cures, etc. They are most numerous in Russian Poland, Roumania, and some parts of Galicia and Hungary, and are regarded with great antipathy by the orthodox Jews. Chasidim is also the name given to a sect which sprang up about the 2d century B.C. This party is credited with instigating the revolt of the Maccabees, and with being the parent stock of the Pharisees.

**Chasing** is the art of working decorative forms in low relief in gold, silver, or other metals. It is generally practised in connection with *repoussé* work, in which the figures are punched out from behind and are then sculptured on the front or *chased* with the graver.

**Chassepot Rifle** (shâs-pō), a breech-loading rifle, named after its inventor, and adopted as the firearm of the French infantry in 1866, but since given up. It was about 4 lbs. lighter than the needle-gun and about 1 lb. lighter than the Martini-Henry rifle.

**Chasseurs** (shâs-eur; a French word signifying 'hunters'), a name given to various sections of light infantry and cavalry in the French service.

**Chastelard** (shât-lär), PIERRE DE BOSCOBEL DE, a young Frenchman, celebrated for his infatuated passion for Mary, Queen of Scots, was born 1540 in Dauphiné. He was of good family, handsome, with a turn for verse-making. He fell madly in love with Mary Stuart at the court of Francis II, followed her to Scotland, and twice invaded the royal bedchamber while Mary was being undressed by her maids. He was tried publicly at St. Andrews and hanged (1563), the queen resisting all

appeals for pardon. She is said to have encouraged his passion more than was consistent with prudence.

**Chasuble** (chas'ū-bl), the upper garment worn by a priest during the celebration of mass. It was originally circular, had a hole in the middle for the head, but no holes for the arms. In later times the sides were

A, Ancient form of Chasuble: 1, Apparel of the neck. 2, 2, 2, 2, Chasuble. 3, 3, Orphreys of the chasuble. 4, The stole. 5, 5, The alb. 6, Apparel of the alb. 7, The maniple.
B, Modern form of Chasuble.

cut away to give a freer motion to the arms, and it has now become an oblong garment hanging down before and behind, made of rich materials, as silk, velvet, cloth of gold, and has a cross embroidered on the back.

**Chat** (chat), the popular name of birds of the genus *Saxicŏla*, family Sylviadæ or warblers. They are small, lively birds, moving incessantly and rapidly about in pursuit of the insects on which they chiefly live. There are three species found in Britain, the stone-chat, whin-chat, and wheatear. The yellow-breasted chat of the United States is a larger bird, belonging to the genus *Icteria* (*I. polyglotta*), family Turdidæ or thrushes.

**Château** (shä-tō), the French term for a castle or mansion in the country; a country-seat.—*Château en Espagne*, literally, a castle in Spain; figuratively a castle in the air, an imaginary palace: a phrase of doubtful origin.

**Châteaubriand** (shä-tō-bri-äṇ), FRANÇOIS AUGUSTE, VICOMTE DE, a celebrated French author and politician, was born at St. Malo, in Brittany, of a noble family, September 14, 1768. After serving in the navy and the army he traveled in North America; but the news of the flight of Louis XVI and his arrest at Varennes brought him back to France. Shortly after he quitted France and joined with other emigrants the Prussian army on the Rhine. After being wounded at the siege of Thionville and suffering many miseries, he made his way to London, where, friendless and penniless, he was just able to earn a subsistence by giving lessons in French and doing translations. Here he published in 1797 his *Essai Historique*, which met with but small success. At this time the death of his mother and the accounts of her last moments transmitted to him by his sister helped to effect a certain change in the religious opinions of Châteaubriand, and from a not very profound skeptic he became a not very profound believer. In 1800 he returned to France, and in the following year published his romance of *Atala*, the scene of which is laid in America, and the year after his celebrated work, *Le Génie du Christianisme*, which is a kind of brilliant picture of Christianity in an æsthetic and romantic aspect. Style, power of description, and eloquence are the merits of the book rather than any depth of thought; but it carried the author's reputation far and wide, and contributed much to the religious reaction of the time. After a short career as diplomatist under Napoleon, Châteaubriand made a tour in the East (1806–7), visiting Greece, Asia Minor, and the Holy Land. As the fruit of his travels he published *Les Martyrs* (1809) and *Itinéraire de Paris à Jérusalem* (1811). He hailed the restoration of Louis XVIII with enthusiasm, was appointed ambassador to Berlin, and then to London, but in 1824 quarreled with the premier, M. de Villèle, and was summarily dismissed. On the revolution of 1830 he refused to take the oath of allegiance to Louis Philippe, forfeiting thus a pension of 12,000 francs. At this time his writings were chiefly political, and mostly appeared as newspaper articles, pamphlets, etc. In his later years he wrote several works, but none of the value of his earlier productions. He died 4th July, 1848, leaving memoirs (*Mémoires d'outre Tombe*) which contain severe judgments on contemporary men and things.

**Châteaudun** (shä-tō-dūṇ), a town of France, dep. Eure-et-Loire, 26 miles S. S. W. of Chartres, near the Loire. The old castle of the

counts of Dunois overlooks the town. Pop. (1906) 5805.

**Château-Gaillard** (shä-tō-gā-yär), a celebrated feudal fortress in France, near Andelys (dep. Eure), built by Richard Cœur de Lion. As late as the 15th century it was considered one of the strongest fortresses in Normandy. Its picturesque situation on a high rock overlooking the river has made it a favorite subject for artists. Turner has twice represented it.

**Château-Gontier** (gōn-tyā), a town of France, department of Mayenne, on the Mayenne, with linen and serge manufactories, bleachfields, tanneries. Pop. 6871.

**Château-Lafitte,** CHATEAU-LATOUR, CHATEAU-MARGAUX (mär-gō), famous vineyards, all in the department of the Gironde, France, furnishing the best of the red wines of Bordeaux. See *Bordelais Wines.*

**Châteauroux** (shä-tō-rō), a town of France, capital of the department of Indre, 144 miles S. S. W. of Paris on the Indre. It has straight, broad streets, and spacious squares. Cloth, cotton hosiery, woolen yarn, paper, etc., are made; and there are tanneries and dyeworks. Pop. 21,048.

**Château-Thierry** (tya-ri), a town of France, dep. Aisne, on the Marne, 38 miles S. S. W. of Laon, with manufactures of linen and cotton twist, pottery, leather, etc. It is the birthplace of La Fontaine. Pop. 6872.

**Châtelet** (shät-lā; diminutive of *château*) was anciently a small castle or fortress. Two such buildings at Paris gained some historical importance—the Grand and Petit Châtelet. The Grand Châtelet was the castle of the Counts of Paris, and was long the seat of certain courts of justice; but latterly, like the Petit Châtelet, was converted into a prison.

**Châtelet** (shät-lā), a manufacturing town of Belgium, prov. of Hainaut, in the Sambre. Pop. 11,867.—CHATELINEAU, opposite to it, has a pop. of 13,154.

**Châtellerault** (shä-tel-rō), a town of France, department Vienne, 20 miles N. N. E. of Poitiers, on the Vienne. It is a place of some antiquity, having once been the capital of a duchy which, in 1548, was bestowed by Henry II on the Earl of Arran, Regent of Scotland, and still gives a title to his descendant, the Duke of Hamilton. It manufactures firearms on an extensive scale, also cutlery very largely, hardware, jewelry, etc. Pop. (1906) 15,214.

**Chatham** (chat'am), a town, naval arsenal, and seaport of England, County Kent, on the Medway, about 34½ miles by rail from London, adjoining Rochester so closely as to form one town with it. The importance of Chatham is due to the naval and military establishments at Brompton in its immediate vicinity. The royal dockyard was founded by Queen Elizabeth previous to the sailing of the Armada. It has been greatly enlarged in recent years, and is now about two miles in length, with most capacious docks, in which the heaviest warships can be equipped and sent directly to sea. Building-slips, sawmills, metal mills, etc., and all the requisites of a great naval station are here on the largest scale and in the finest order. The military establishments include extensive barracks, arsenal, and park of artillery, hospital, storehouses and magazines, etc. The town is poorly built, but is defended by a strong line of fortifications. Pop. (1911) 42,250.

**Chatham,** a town of Canada, prov. Ontario on the river Thames, 11 miles north of Lake Erie, with water communication with the Great Lakes. There are manufactures of machinery, iron and steel castings, woolens, carriages, motor trucks, agricultural implements, etc. Pop. 11,760.

**Chatham,** a town in New Brunswick, on the Miramichi, the seat of a Roman Catholic bishop, with a large trade in lumber. Pop. 4868.

**Chatham,** WILLIAM PITT, EARL OF, one of the most illustrious statesmen of Britain, the son of Robert Pitt of Boconnoc, in Cornwall,

William Pitt, Earl of Chatham.

born Nov. 15, 1708, and educated at Eton and Oxford. He entered parliament as member for the borough of Old Sarum (which was the property of his family), and soon attracted notice as a powerful opponent of Walpole. In spite of the king's dislike Pitt was powerful enough to win a place in the administration (1746), first as vice-treasurer of Ireland, and afterwards as paymaster-general. In 1756 he became secretary of state and real head of the government. Dismissed in 1757 on account of his opposition to the king's Hanoverian policy, no stable administration could be formed without him, and he returned to power the same year in conjunction with the Duke of Newcastle. It was under this administration and entirely under the inspiration of Pitt that Britain rose to a place among the nations she had not before occupied. Wolfe and Clive, both stimulated and supported in their great designs by Pitt, won Canada and India from the French and the support the Great Commoner gave Frederick of Prussia contributed not a little to the destruction of French predominance in Europe. The accession of George III brought Lord Bute into power, and Pitt, disagreeing with Bute, resigned in 1761. In 1766 he strongly advocated conciliatory measures towards the American colonies, and undertook the same year to form an administration, he going to the House of Lords as Earl of Chatham. But the ministry was not a success, and in 1768 he resigned. After this his principal work was his appeals for a conciliatory policy towards the colonies. But his advice was disregarded, and the colonies declared themselves independent in 1776. Chatham died May 11, 1778. He received a public funeral and a magnificent monument in Westminster Abbey. The character of Chatham was marked by integrity, disinterestedness, and patriotism. With great oratorical gifts and the insight of a great statesman he had liberal and elevated sentiments; but he was haughty and showed too marked a consciousness of his own superiority.

**Chatham Islands,** a group of three islands in the South Pacific Ocean, belonging to New Zealand. The largest, or Chatham Island, lat. (S. point) 44° 7′ S.; long. 176° 49′ W., about 350 miles E. from New Zealand, and is about 38 miles long and 25 broad. Pitt Island is much smaller, and Rangatira is an insignificant patch. A considerable portion of Chatham Island is occupied by a salt lagoon. The soil is in many places fertile, and crops of potatoes, wheat, and vegetables are successfully grown. Cattle and sheep are reared, and thus whaling or other vessels that call are supplied with fresh provisions as well as with water. The original inhabitants, called Morioris, differed considerably from the Maoris, by whom and a mixed race they have been supplanted. The present population amounts to only 420. The islands were discovered in 1791.

**Chati** (chă'tē), a species of small leopard found in South America, very destructive to small quadrupeds and birds, and especially to poultry-yards, but so gentle, when domesticated, as to have gained for itself the name of *Felis mitis*, or gentle leopard.

**Châtillon-sur-Seine** (shă-tē-yŏn-sür-sen), a town of France, department of Côte d'Or, 45 miles N.W. of Dijon, on the Seine. It is chiefly notable for the congress of the allied powers and France held here in 1814. Pop. 4430.

**Chat Moss,** an extensive morass, area about 6000 to 7000 acres, situate chiefly in the parish of Eccles, Lancashire. It is remarkable as being the scene of operations for reclaiming bog-lands, at first successfully carried out on a large scale at the end of the eighteenth and beginning of the nineteenth century;—also for offering one more field of triumph to George Stephenson, who in 1829 carried the Liverpool and Manchester Railway over it after all other engineers had declared the feat impossible.

**Chatoyant** (sha-toi'ant), a term applied to gems that have, when cut and polished, a changeable, undulating luster like that of a cat's eye in the dark.

**Châtre** (shă-tr), La, an old town of France dep. Indre, 21 miles S.E. of Châteauroux, right bank of the Indre. Pop. about 5000.

**Chatsworth** (chats'worth), an estate of the Dukes of Devonshire, in Derbyshire, purchased in the reign of Elizabeth by William Cavendish, who began the building of a hall which served as one of the prisons of Mary, Queen of Scots. The present building was nearly completed by the first Duke of Devonshire between 1687 and 1706, the north wing being added by the sixth duke. It forms a square, with an inner court, and is remarkable for the collections of pictures and statues it contains. The façade is 720 feet long, or with the terraces 1200 feet. The park is about 11 miles in circumference, di-

versified by hill and dale. The conservatory covers nearly an acre, and was designed by Paxton, forming on a small scale the forerunner of the exhibition building of 1851.

**Chattahoochee** (chat-a-hŏ'chē), a river of the United States, rising in the Appalachian Mountains in Georgia, and forming for a considerable distance the boundary between Georgia and Alabama. In its lower course, after the junction of the Flint River, it is named the Appalachicola, and is navigable to Columbus in Georgia for steamboats. Total course, about 550 miles.

**Chattanooga** (chat-a-nŏ'ga), a city, capital of Hamilton Co., Tennessee, on the Tennessee River, near the Georgia boundary, an important center of trade and manufactures, its industries including iron works on a large scale, textile mills, car, wagon and carriage factories, implement works, stove works, furniture factories, boiler works, structural steel works, tanneries, etc., while it has an extensive trade in cotton, coal, iron and wheat. There is available 150,000 hydro-electric horsepower. During the Civil War, in Nov., 1863, the Confederates here suffered a great defeat after three battles, known as Lookout Mountain, Chickamauga and Missionary Ridge. Population, with suburbs, 100,200.

**Chattels** (chat'els), property movable and immovable, not being freehold. The word *chattel* is originally the same work with *cattle*, formed from late Latin *capitalia*, meaning heads of cattle, from L. *caput*, head. Chattels are divided into real and personal. Chattels *real* are such as belong not to the person immediately, but dependent upon something, as an interest in a land or tenement, or a lease, or an interest in advowsons. Chattels *personal* are goods which belong immediately to the person of the owner.

**Chatterers** (chat'er-ers), the popular name of certain insessorial birds of the family Ampelidæ, genus *Ampĕlis*), as the Bohemian chatterer or waxwing (*Ampĕlis garrŭla*) and the chatterer of Carolina (*A. cedrŏrum*).

**Chatterton** (chat'er-ton), THOMAS, a youth whose genius and melancholy fate have gained him much celebrity, was born at Bristol in 1752, of poor parents, and educated at the charity school. He exhibited great precocity, became extremely devoted to reading, and was especially fond of old writings and documents. At the age of fourteen he was apprenticed to an attorney. In 1768, when the new bridge at Bristol was completed, he inserted a paper in the *Bristol Journal* entitled *A Description of the Friars' First Passing over the Old Bridge*, which he pretended he had found along with other old manuscripts in an old chest in St. Mary Redcliffe Church, Bristol. He also showed his friends several poems of similarly spurious antiquity which he attributed to one Rowley. In 1769 he ventured to write to Horace Walpole, then engaged upon his *Anecdotes of Painters*, giving him an account of a number of old Bristol painters which was clever enough to deceive Walpole for a time. Dismissed from the attorney's office, he left with his manuscripts for London, where a favorable reception from the booksellers gave him high hopes. For them he wrote numerous pamphlets, satires, letters, etc., but got no substantial return, and his situation became daily more desperate. At last, after having been several days without food, he poisoned himself, 25th August, 1770. The most remarkable of his poems are those published under the name of Rowley, spurious antiques, such as *The Tragedy of Ælla*, *The Battle of Hastings*, *The Bristow Tragedy*, etc.

**Chatterton's Compound**, a mixture of Stockholm tar, resin, and gutta percha, used in the construction of submarine telegraph cables, etc.

**Chaucer** (chą'sĕr), GEOFFREY, 'the father of English poetry,' born in London probably about 1340, and not in 1328, the date formerly given;

Geoffrey Chaucer.

died there on the 25th of October, 1400. He was the son of a vintner named

John Chaucer. Nothing is known of his education, but in 1356–59 he was a page to Princess Lionel. He tells us himself that in 1359 he bore arms in France and was taken prisoner. He was ransomed next year, the king paying £16 towards the necessary sum. In 1367 we find his name as a valet of the king's chamber. Whether he married his wife Philippa in 1366 or not till 1374, and who she was, we do not know for certain. In 1367 he received a pension of twenty marks, and between 1370 and 1380 he was employed abroad in seven diplomatic missions. In one of these, in 1372, he was sent to Genoa as a commissioner to negotiate a commercial treaty. It is probable that he visited the Italian poet Petrarch on this occasion. In 1374 he was appointed comptroller of the customs on wool at London, a lucrative post, and he also received an annual allowance. In 1377 he was sent to Flanders and France on diplomatic business, and next year to Lombardy. In 1382 he was appointed comptroller of the petty customs. In 1386 he was returned to parliament as knight of the shire for Kent, but in the same year he shared the disgrace of his patron, John of Gaunt, was dismissed from his comptrollership, and reduced to a state of comparative poverty. Three years later, however, he was made clerk of the works at 2*s.* a day, and afterwards had other offices and one or two annuities bestowed upon him, but in 1394–98 he must have been quite poor. In 1399 he got a pension of forty marks from Henry IV, but did not live long to enjoy it. His most celebrated work, *The Canterbury Tales*, was written at different periods between 1373 and 1400. It consists of a series of tales in verse (two in prose), supposed to be told by a company of pilgrims to the shrine of St. Thomas (Becket) at Canterbury in 1386. In its pages we get such pictures of English life and English ways of thought in the 14th century as are found nowhere else, while it displays poetical skill and taste of a high grade. Besides this brilliant production Chaucer wrote many poems (and others are falsely attributed to him): *The Book of the Duchess* (1369), *The Parliament of Fowls* (1374), *Troilus and Cressida* (1380–82), *The Legend of Good Women* (1385), *The House of Fame* (1386), etc., some of which are founded on French or Italian works. He also translated Bœthius, and wrote a treatise on the Astrolabe (1391) for his son Lewis (who probably died early). He was buried in Westminster Abbey.

**Chauci** (chą'sē), an ancient Teutonic tribe dwelling E. of the Frisians, between the Ems and Elbe on the shore of the German Ocean.

**Chaudes-Aigues** (shōd-āg), a village of France, department of Cantal, 28 miles E. S. E. of Aurillac, with thermal springs so copious that the water is used for warming the town in winter and for washing fleeces. Pop. (commune) 1558.

**Chaudet** (shō-dā), ANTOINE DENIS, a French sculptor, born at Paris in 1763; died there in 1810. His first work was a bas-relief under the peristyle of the Pantheon, representing the love of glory, an excellent work, the very simplicity and grandeur of which prevented it being justly estimated by the false taste of the age. In the museums of the Luxembourg and Trianon are several of Chaudet's finest works: *La Sensibilité*, the beautiful statue of *Cyparissa*, etc.

**Chaudière** (shōd-yār), a river of Canada, Quebec province, which rises on the borders of Maine, near the sources of the Kennebec, and flows into the St. Lawrence about 6 miles above Quebec. The banks of the river are generally steep and rocky, and about three miles above its junction with the St. Lawrence are the Chaudière Falls, about 120 feet high. On the Ottawa river are other two falls of lesser dimensions known as the Great and the Little Chaudière.

**Chauffeur** (shō-fėr; French for stoker or fireman), the driver operating an automobile and the mechanic carried to look after its machinery and fuel, these being usually combined in one person. See *Automobile.*

**Chaulmugra** (shäl'mū-gra), a tree (*Gynocardia odorāta*) of S. Asia, from the seeds of which an oil is obtained that has long been known and highly valued in India and China as a remedy in skin diseases and complaints arising from blood impurities, and has been introduced into western countries in the treatment both of skin and chest diseases.

**Chaumont** (shō-mōn), a town of France, capital of the department of Haute-Marne, on a height between the Marne and the Suize, with manufactures in woolens, hosiery, etc. Here the allies (Great Britain, Russia, Austria, and Prussia) signed the treaty of alliance against Napoleon, March 1, 1814. Pop. 12,089.

**Chaumontelle** (shō-mon-tel'), a delicious dessert pear

which is much grown in Jersey, Guernsey, and the south of England.

**Chauny** (shō'nē), a town of France, dep. Aisne, 22 miles w. of Laon. It was the scene of much fighting during the European war. It was captured by the Germans in the first drive on Paris in August, 1914, retaken by the Allies in 1917, and fell again into German hands in March, 1918. It had extensive cotton mills, bleaching grounds and tanneries, and manufactures of sacking, soda, sulphuric and nitric acids. Pop. (1914) 10,127.

**Chausses** (shōs), the tight covering for the legs and body, reaching to the waist, formerly worn by men of nearly all classes throughout Europe. They resembled tight pantaloons with feet to them. The name *chausses de mailles* was given to defensive armor worn on the same parts of the body.

**Chautauqua** (chȧ-tą'kwȧ), a beautiful lake in New York, 18 miles long and 1-3 broad, 726 feet above Lake Erie, from which it is 8 m. distant. On its banks is the village of Chautauqua, the center of a religious and educational movement of some interest. This originated in 1874, when the village was selected as a summer place of meeting for all interested in Sunday schools and missions. Since then the Chautauqua Literary and Scientific Circle has taken origin here, the most prominent feature of which is to engage the members—wherever they may reside—in a regular and systematic course of reading, extending, when completed over four years and entitling the student to a diploma. There are many local branches or societies.

**Chauvinism** (shō'vin-izm), an unreflecting and fanatical devotion to any cause, especially an exaggerated patriotism, so called from *Nicholas Chauvin*, a soldier so enthusiastically devoted to Napoleon I and so demonstrative in his adoration that his comrades turned him into ridicule.

**Chaux-de-Fonds** (shōd-fōn), La, a town of Switzerland, in the canton and 9 miles N. W. of the town of Neufchâtel, in a deep valley of the Jura. The inhabitants are largely engaged in the making of watches and clocks, of which Chaux-de-Fonds and Locle are the chief centers in Switzerland, and in similar branches of industry. Pop. 36,388.

**Chavica** (chav'i-ka), a genus of plants, nat. order Piperaceæ, including the common long pepper, Java long pepper, and betel-pepper.

**Chay-root** (shā), the roots of a small biennial plant of Hindustan, the *Oldenlandia umbellata*, growing spontaneously on dry, sandy ground near the sea; and extensively cultivated, chiefly on the Coromandel coast. It yields a dye which is much used in coloring Indian cotton and chintzes.

**Cheboygan** (she-boi'gan), Michigan, a town on Lake Huron, at the mouth of Cheboygan River. It has woodworking establishments, paper, leather and wood-alcohol works, etc. Pop. 6859.

**Check.** See *Cheque.*

**Checkers** (chek'ers), the common name in the United States for the game of draughts (which see).

**Checkmate** (chek'māt). See *Chess.*

**Cheddar** (ched'ar), a parish and thriving village, England, County Somerset, 18 miles S. W. Bristol. The dairies in the neighborhood have long been famous for the excellence of their cheese, which is made from the whole milk, and the whey skimmed off, heated, and added to the curd.

**Cheduba** (che-dō'ba), an island in the Bay of Bengal, belonging to Burmah, about 25 miles off the coast of Arracan; length and breadth, each about 15 miles; area, nearly 250 square miles; pop. about 25,000. The soil is fertile and produces tobacco, rice, indigo, pepper, etc. Petroleum is also found.

**Cheese** (chēs), one of the important products of the dairy, is composed principally of *casein*, which exists in cows' milk to the extent of about 3 or 4 per cent., fat, and water. It is made from milk, skimmed wholly, partially, or not at all, the milk being curdled or coagulated, and the watery portion or whey separated from the insoluble curd, which being then worked into a uniform mass, salted (as a rule), and pressed into a vat or mold forms cheese, but requires to be *cured* or *ripened* for a time before being used. The coagulation of the milk may be effected either by adding an acid as in Holland, or sour milk as in Switzerland, or rennet as usual in Britain and America. There are a great many varieties of cheese, of which the most notable are Stilton, Cheshire, Cheddar, Dunlop, amongst British; and Parmesan, Gruyère, Gorgonzola, Gouda, Roquefort, Limburg, etc., amongst European ones. (See different articles.) In America immense quantities of cheese are made,

almost all the different European kinds being imitated. Large factories are there devoted to the manufacture. Other kinds are known as sour-milk, skimmed-milk, cream, sweet-milk, etc., cheese. Sheep's and goats' milk cheese are also made.

**Cheesefly,** a small, black, dipterous insect bred in cheese, the *Piophila casei*, of the same family to which the housefly, blowfly, etc., belong. It has a very extensible ovipositor which it can sink to a great depth in the cracks of cheese, and lay its eggs there. The magot, well known as the cheesehopper, is furnished with two horny, claw-shaped mandibles, which it uses both for digging into the cheese and for moving itself, having no feet. Its leaps are performed by a jerk, first bringing itself into a circular attitude, when it can project itself twenty to thirty times its own length.

**Cheesehopper.** See *Cheesefly.*

**Cheese-rennet,** a popular name of the plant *bedstraw.*

**Cheetah.** Same as *Chetah.*

**Che-Foo** (chē'fō'), a town of China in the province of Shantung, one of the last ports opened to foreign trade, which is now of considerable volume. Pop. about 35,000.

**Cheilognatha** (kī-log'na-tha), one of the two orders of Myriapoda, including the millipedes and other forms.

**Cheilopoda** (kī-lop'o-da), one of the two orders of Myriapoda, represented by the centipedes in which a pair of mandibles two pairs off maxillipeds or foot-jaws and a lower lip are developed.

**Cheiranthus** (kī-ran'thus), the wall-flower genus of plants.

**Cheirolepis** (kī-rol'e-pis), a genus of fossil ganoid fishes found in the Old Red Sandstone of Orkney and Morayshire, characterized by the great development of the pectoral and ventral fins.

**Cheiromancy** (kī'ro-man-si), or PALMISTRY, the art of divining by inspection of the lines of the hand; it was practised in India in the remotest ages; in Europe, during the middle ages, it was in great repute, but latterly it took refuge among the gypsies.

**Cheironectes** (kī-rō-nek'tēz), a genus of acanthopterygious fishes, having the pectoral fins supported, like short feet, upon pedunciles by means of which they are enabled to creep over mud and sand when left dry by the receding tide, and also to take short leaps like a frog, whence the name frogfish, as well as handfish. They are found in the estuaries of the northeast of Australia.—The same name is given to a Brazilian genus of opossums, in which the hinder hands are webbed, the Yapock opossum.

**Cheiropractic.** See *Chiropractic.*

**Cheiroptera** (kī-rop'te-ra), or BATS, an order of mammals, the essential character of which is the possession of a *patagium*, or expansion of the integument of the body which connects the tail throughout its whole length to the hinder limbs as far as the ankle, and thence passes along the side of the body to the fore-limbs, which are greatly elongated, and give support and varied movement to the expansion (which is popularly called the wing) by means of the very long and slender digits. Other mammals, as some of the squirrels and the flying lemur, have the power of gliding through the air for some distance, but none of them has the power of sustained flight, nor are the anterior extremities modified in the same way as are those of the bats. The Cheiroptera are divided into two sub-orders, *Frugivora*, or Fruit-eaters, and *Insectivora*, or Insect-eaters. (See *Bat.*)

Skeleton and Wing-Membranes of Noctule Bat.

**Cheirotherium** (kī-rō-thē'ri-um), a name given to a great unknown animal that formed the larger footsteps upon the slabs of the Trias, or upper New Red Sandstone, and which bear a resemblance to the human hand. It is supposed to be identical with the labyrinthodon.

**Cheke** (chēk), SIR JOHN, an English scholar, born at Cambridge in 1514; educated at St. John's College, and made regius professor of Greek. In 1544 he was appointed tutor to the future Edward VI, and he became secretary of state in 1553, and was also privy-councillor. On the king's death he supported Lady Jane Grey, and was committed to the Tower. After a few months, however, he was set at liberty and settled at Strasburg; but his connection with the English Protestant church gave offense to the Catholics and, and his estates were

confiscated. He supported himself by teaching Greek, but in 1556, having been induced to visit Brussels, he was arrested by order of Philip II and sent prisoner to England. Under threat of the stake he recanted, and received the equivalent of his forfeited estates; but he felt so keenly his degradation that he died of grief in 1557. His chief distinction was the impulse given by him to the study of Greek.

**Che-kiang** (che-ke-âng'), a maritime province of China, between lat. 27° and 31° N., and including the Chusan Archipelago; area, 35,000 sq. miles; pop. about 12,000,000. It is traversed by the Grand Canal, and has as its principal ports Ningpo and Hangchow, the capital. Staple exports, silk and tea.

**Chelæ** (kē'lē), the large prehensile claws of crabs and other crustaceans, or of the scorpions.

**Chelidonium** (kel-i-dō'ni-um). See *Celandine.*

**Chelmsford** (chems'ford), a county town of Essex, England, in a valley between the Chelmer and Cann, with several handsome public buildings. There are manufactories of agricultural implements, and a considerable trade in corn, malt, etc. Pop. (1911) 18,008.

**Chelmsford,** SIR FREDERICK THESIGER, LORD, an eminent English lawyer, born in London in 1794; died in 1878; entered parliament in 1840; was solicitor-general and attorney-general under Sir Robert Peel, was appointed lord chancellor of England in 1858 and made Lord Chelmsford; was appointed lord chancellor again in 1866.—His son, the second Lord Chelmsford (FREDERICK AUGUSTUS THESIGER), born in 1827; died in 1905; was educated at Eton, and served in the Crimea and through the Indian mutiny. As deputy adjutant-general he served in the Abyssinian campaign, was nominated C.B., made aide-de-camp to her Majesty, and adjutant-general to the forces in India (1868–76), and in 1877 was appointed commander of the forces and lieutenant-governor of Cape Colony. He restored Kaffraria to tranquillity, and was given the chief command in the Zulu war of 1879. After great difficulties with the transport, and some disasters, he gained the decisive victory of Ulundi, before the arrival of Sir Garnet Wolseley, who had been sent to supersede him. On his return to England he was made G.C.B., and in 1884 became Lieutenant of the Tower. Promoted lieutenant-general in 1882 and general in 1888, he was placed on the retired list in 1893.

**Chelonians** (ke-lō'ni-ans), or CHELONIA, an order of reptiles including the tortoises and turtles, and distinguished by the body being inclosed in a double shell, out of which the head, tail, and four legs protrude. The order is divided into five families: the Chelididæ, or frog-tortoises; Testudinidæ, or land-tortoises; Emydæ, the terrapins or fresh-water tortoises; Trionychidæ, the mud-turtles or soft-tortoises; Chelonidæ, or sea-turtles. See *Tortoise, Turtle.*

**Chelsea** (chel'sē), a suburb of London, and a parliamentary borough, on the Thames, opposite Battersea, and chiefly distinguished for containing a royal military hospital, originally commenced by James I as a theological college, but converted by Charles II into an asylum for the reception of sick, maimed, and superannuated soldiers. The building was finished in 1692 by Sir Christopher Wren. Connected with the hospital is a royal military asylum, founded in 1801, for the education and maintenance of soldiers' children. Pop. 66,404.

**Chelsea,** a city of Massachusetts, forming a N. E. suburb of Boston. (See *Boston.*) Pop. 32,452.

**Cheltenham** (chel'tn-am), a municipal and parliamentary borough and fashionable watering-place in England, in the county of Gloucester, on the small river Chelt, within the shelter of the Cotswold Hills. The town has fine squares, crescents, terraces, gardens and drives, assembly-rooms, theater, etc., and has become especially distinguished as an educational center. Pop. 48,944.

**Chemiotherapeutics** (kem-i-o-thēr-a-pū'tiks), the science which deals with the treatment of disease by the application of chemical principles. Its aim is the cure of disease by rationalized chemical principles founded on the results of exact chemical research. In the past new remedies were discovered largely by accident. The chemiotherapists go to work with laboratory methods to find the chemical that will kill the parasite causing the disease without killing the patient. Such is the method which gave the world one of the greatest therapeutic discoveries since vaccination—salvarsan (which see).

**Chemistry** (kem'is-tri), the science which treats of the nature, laws of combination, and mutual actions of the minute particles of the different sorts of matter composing our universe, and the properties of the compounds they form. As a science it is

entirely of modern origin, in its earliest phases being identical with alchemy (which see), the great object of which was the discovery of the philosopher's stone. In this pursuit of alchemy most minerals, especially such as presented the characters of metallic ores, were subjected to numerous experiments, and many important isolated discoveries were made by Basil Valentine, Raymond Lully, Paracelsus, Van Helmont, and others. But during the latter part of the 17th century the belief in alchemy was greatly on the wane, and just at its close the German chemist Becher threw out certain speculations regarding the cause of combustion, which were afterwards taken up and extended by Stahl in the 'phlogistic theory,' and constitute the first generalization of the phenomena of chemistry, though the theory itself was diametrically opposed to the truth. About the middle of the eighteenth century Dr. Black made his great discovery of a gas differing from atmospheric air, rapidly followed by that of a number of other gases by Cavendish, Rutherford, Priestley, Scheele, etc.; while the discovery of oxygen by the two last-named chemists afforded to Lavoisier the means of revolutionizing and systematizing the science. By a series of experiments he showed that all substances, when burned, absorb oxygen, and that the weight of the products of combustion is exactly equal to that of the combustible consumed and of the oxygen which has disappeared. The application of this theory to the great majority of the most important chemical phenomena was obvious, and the Stahlian hypothesis disappeared from the science. A yet more important step was the discovery by Dalton of the laws of chemical combination. His theory was immediately taken up by Berzelius, to whose influence and careful determination of the chemical equivalents of almost all the elements then known its rapid adoption was mainly due. To Berzelius we owe almost all the modern improvements in the methods of analysis, and to Sir H. Davy the foundation of electro-chemistry. Of late years every branch of the science has advanced, but the most extraordinary progress has been made in organic chemistry. The investigations of chemists have shown that the great majority of the different substances found at the surface of the earth can be broken up into several substances of less complicated nature, which resist all further attempts to decompose them, and appear to consist of only one kind of matter. These substances, by union of which all the different sorts of known matter are built up, are more than seventy in number, and are called the *chemical elements*. The list (given below) includes such substances as gold, iron, oxygen, hydrogen, carbon, calcium, etc. When any two or more of these elements are brought in contact, under the proper conditions, they may unite and form chemical compounds of greater or less complexity, in which the constituents are held in union by a form of energy which has received the name of chemical affinity. This affinity is characterized by its acting between dissimilar particles, and producing a new substance different and readily distinguishable from either of the substances combining to form it, and which cannot be again separated into its elements by merely mechanical processes.

*Laws of Combination.*—(1) Chemical combination takes place between the smallest particles of matter and at inappreciable distances. Thus fragments of phosphorus and iodine may be placed near each other, but do not combine until brought into actual contact. (2) Chemical combination invariably effects a change in all bodies. There are changes of state, temperature, color, volume, taste, smell, etc. (3) Chemical combination takes place with different degrees of force in different bodies. The more unlike two bodies are, the greater the violence with which they combine. (4) Chemical combination is much affected by other forces. Heat, light, electricity, mechanical force, etc., may either accelerate or retard it. (5) All substances, elementary and compound, combine together in fixed and definite proportions by weight. (6) When bodies combine in more than one proportion their other combining proportions are simple multiples of the lowest. Thus, 28 parts of nitrogen combine with 16 parts of oxygen to form nitrous oxide, while 28 parts of the former and 32 of the oxygen produce nitric oxide, and an additional 16 of oxygen forms nitric trioxide, etc. (7) Gases combine in fixed and definite proportions by volume as well as by weight. If one volume of each gas be combined together, two volumes of the gaseous compound result. If more than one volume of each combine together, the new compound occupies only two volumes, however great the aggregate number of volumes is before combination takes place. (8) The combining proportions of compounds are the sum of the combining proportions of their constituent elements.

The *atomic weight* of any element is now assumed to be the smallest quantity which can enter into or be expelled from

combination, one part of hydrogen being taken as the standard. The following table contains a list of the elements with their atomic weights and symbols (the latter being explained in a succeeding paragraph). The list given was adopted in the autumn of 1910 by the International Committee on Atomic Weights.

| | | | | | |
|---|---|---|---|---|---|
| Aluminium | Al | 27.1 | Neodymium | Nd | 144.3 |
| Antimony | Sb | 120.2 | Neon | Ne | 20.2 |
| Argon | A | 39.88 | Nickel | Ni | 58.68 |
| Arsenic | As | 74.96 | Nitrogen | N | 14.01 |
| Barium | Ba | 137.37 | Osmium | Os | 190.9 |
| Bismuth | Bi | 208.0 | Oxygen | O | 16.0 |
| Boron | B | 11.0 | Palladium | Pd | 106.7 |
| Bromine | Br | 79.92 | Phosphorus | P | 31.04 |
| Cadmium | Cd | 112.40 | Platinum | Pt | 195.2 |
| Cæsium | Cs | 132.81 | Potassium | K | 39.10 |
| Calcium | Ca | 40.09 | Praseodymium | Pr | 140.6 |
| Carbon | C | 12.0 | Radium | Ra | 226.4 |
| Cerium | Ce | 140.25 | Rhodium | Rh | 102.9 |
| Chlorine | Cl | 35.46 | Rubidium | Rb | 85.45 |
| Chromium | Cr | 52.0 | Ruthenium | Ru | 101.7 |
| Cobalt | Co | 58.97 | Samarium | Sa | 150.4 |
| Columbium | Cb | 93.5 | Scandium | Sc | 44.1 |
| Copper | Cu | 63.57 | Selenium | Se | 79.2 |
| Dysprosium | Dy | 162.5 | Silicon | Si | 28.3 |
| Erbium | E | 167.4 | Silver | Ag | 107.88 |
| Europium | Eu | 152.0 | Sodium | Na | 23.0 |
| Fluorine | F | 19.0 | Strontium | Sr | 87.63 |
| Gadolinium | Gd | 157.3 | Sulphur | S | 32.07 |
| Gallium | Ga | 69.9 | Tantalum | Ta | 181.0 |
| Germanium | Ge | 72.5 | Tellurium | Te | 127.5 |
| Glucinium | Gl | 9.1 | Terbium | Tb | 159.2 |
| Gold | Au | 197.2 | Thallium | Tl | 204.0 |
| Helium | He | 3.99 | Thorium | Th | 232.4 |
| Hydrogen | H | 1.008 | Thulium | Tm | 168.5 |
| Indium | In | 114.8 | Tin | Sn | 119.0 |
| Iodine | I | 126.92 | Titanium | Ti | 48.1 |
| Iridium | Ir | 193.1 | Tungsten | W | 184.0 |
| Iron | Fe | 55.85 | Uranium | U | 238.5 |
| Krypton | Kr | 82.92 | Vanadium | V | 51.06 |
| Lanthanium | La | 139.0 | Xenon | Xe | 130.2 |
| Lead | Pb | 207.1 | Ytterbium (Neoytterbium) | Yb | 172.0 |
| Lithium | Li | 6.94 | Yttrium | Yt | 89.0 |
| Lutecium | Lu | 174.0 | Zinc | Zn | 65.37 |
| Magnesium | Mg | 24.32 | Zirconium | Zr | 90.6 |
| Manganese | Mn | 54.93 | | | |
| Mercury | Hg | 200.0 | | | |
| Molybdenum | Mo | 96.0 | | | |

*Nomenclature.*—The names employed by the old chemists were generally derived from some property of the body or indicated the mode in which it was prepared, and sometimes the substance from which it was obtained. Soon after the introduction of Lavoisier's system the French Academy of Sciences appointed a committee to improve it; and the chief merit of the one introduced is due to Guyton Morveau. Though somewhat modified to suit the requirements of modern science, it still remains substantially what it was. The names applied to the elements were as far as possible derived from some conspicuous property they possess; *e.g.* chlorine, from Greek *chlōros*, yellow. An attempt has been made to make the name express also the class to which the substance belongs. Thus all the metals (except those long known) are made to terminate in *um*, as potassium, barium, etc.; and the substances allied to chlorine terminate in *ine*. The nomenclature of compounds was based on the existence of two classes of substances opposed to one another in their properties, and known as *acids* and *bases*. All the bases known at the close of the last century were oxygen compounds, and they were known by the general name of *oxides*. The compounds of chlorine, iodine, and bromine, and subsequently those of sulphur, carbon, boron, and silicon, though really belonging to a different class, were called chlorides, iodides, bromides, sulphides, etc. After the atomic theory came into use, the term oxide was confined to a compound containing one atom of oxygen in combination with one of the other elements. The compound containing two atoms of oxygen became a binoxide, that with three a teroxide, and so on; the numeral prefix always expressing the number of atoms of oxygen. So also we speak of a protochloride and bichloride, a protosulphide and bisulphide. So also there are a number of oxides containing two equivalents of metal to three of oxygen; such compounds are called sesquioxides. Names constructed in this way are extremely definite, and express very precisely the constitution of the compounds; but of late years it has been found preferable to use names of less precision, and to distinguish only between the larger and smaller proportions of oxygen. Thus, there are two oxides of iron possessing basic properties, which are called, respectively, ferrous and ferric oxide, the termination in *ous* being used in all cases for the compound containing the smaller, and that in *ic* for the one containing the larger quantity of oxygen, the Latin name of the element being usually employed. Both systems, however, are still in common use, and each has its special advantages. The nomenclature for compounds possessing acid instead of basic properties has its origin in part in the belief entertained by chemists in the last century that all acids were oxygen compounds, and that it was therefore unnecessary to indicate the existence of oxygen in them, as the word acid sufficiently did so. Thus sulphur forms two different acid compounds, one with a smaller proportion of oxygen than the other, called, respectively, sulphurous and sulphuric acids; and similarly we have chlorous and chloric acids, etc. The contrivers of the present nomenclature did not provide for more than two acid compounds of any one element, that

being the largest number then known. But since that time it has been found that there may be four or five such compounds, necessitating the use of a distinctive prefix, as in the case of hyposulphurous and hyposulphuric acids, the prefix (from Greek *hypo*, under) expressing the fact that they contain smaller quantities of oxygen than the other acids. In the case of chlorine and oxygen, after the name chloric acid had been made use of, another acid containing a larger quantity of oxygen was discovered, for which the name of hyperchloric acid, usually shortened into perchloric acid, was devised. Further observation, however, showed that there were many powerful acids which contained no oxygen, but that hydrogen was invariably present, and it became necessary to distinguish those which contained hydrogen only. Accordingly we have hydrochloric acid, a compound of hydrogen and chlorine, in contrast with chloric acid, a compound of hydrogen, chlorine, and oxygen; and hydrosulphuric acid, a compound of hydrogen and sulphur, in contrast with sulphuric acid, a compound of hydrogen, sulphur, and oxygen. These form the two classes *oxy-acids* and *non-oxy-acids*.

The names of acids were formed in order to enable chemists to have simple designations for *salts*, a class of bodies produced when a metal takes the place of the hydrogen of an acid. Thus the termination in *ate* expressed the fact that the salt is derived from an acid whose name terminates in *ic*, and the salts of acids whose names end in *ous* have their termination in *ite*. Very frequently two salts, generally of the same acid, combine to form what is usually known as a double salt, as, for instance, potassium sulphate and zinc sulphate combine, and the compound is called the zinco-potassic sulphate.

This system of nomenclature, which fulfilled the requirements of chemistry at the time it was devised, became less and less convenient as more complex compounds were discovered, and many attempts have been made to modify and extend it. These attempts, however, have uniformly failed to meet the approval of chemists.

*Symbols.*—Very soon after the publication of Dalton's views Berzelius introduced a system of symbols by which the composition of the more complex chemical compounds can be represented with much greater precision than any nomenclature admits of; and the plan proposed by him, though with some modifications, is now universally accepted. Every element is represented by a symbol, which is the initial letter of its Latin name. Thus S represents sulphur, and K potassium, of which the Latin name is *kalium*. Where several elements have the same initial a small letter is attached to it for the sake of distinction. Thus, C is the symbol of carbon, Ca that of calcium, Ce cerium, Co cobalt, and Cu copper (*cuprum*). These symbols are further understood in all cases to represent an atom of each element. The symbols of compounds are formed by the juxtaposition of those of their elements. Thus—

H Cl..... ...Hydrochloric acid,
Ba S.....Baric sulphide,

express the fact that these compounds contain single atoms of their constituents; that hydrochloric acid, for example, is a compound of 1 part of hydrogen and 35.5 of chlorine; and baric sulphide of 137 parts of that metal and 32 of sulphur. When more than one atom of an element exists in any compound this is indicated by a co-efficient placed after its symbol. Thus $H_2O$ is a compound of two atoms of hydrogen and one of oxygen; $SO_3$, a compound of one atom of sulphur and three of oxygen; $Fe_2Cl_6$, a compound of two atoms of iron and six of chlorine. Where it is necessary to express more than one atom or molecule of the compound this is done by prefixing to the symbol a large number written on the line. Thus $2BaCl_2$ means two molecules of barytic chloride; $3Fe_2O_3$, three molecules of ferric oxide. By a systematic arrangement of the symbols in each compound an attempt is made to indicate to a certain extent their chemical functions. Thus, in an acid, the hydrogen, which may be replaced by a metal, begins the formula of the compound; sulphuric acid, for instance, is written $H_2SO_4$, and potassic sulphate $K_2SO_4$, the potassium here occupying the same position as the hydrogen it has displaced.

The symbols are also very advantageously used to express the changes which occur during chemical action, and they are then written in the form of an equation, of which one side represents the condition in which the substances exist before the change, the other the result of the reaction. Thus—

| | | | | |
|---|---|---|---|---|
| H | + | Cl | = | H Cl. |
| Hydrogen. | | Chlorine. | | Hydrochloric acid. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| $K_2SO_4$ | + | $Ba_2(NO_3)$ | = | $BaSO_4$ | + | $2KNO_3$ | |
| Potassic sulphate. | | Baric nitrate. | | Baric sulphate. | | Potassic nitrate. | |

*Atomicity.*—When an atom of chlor-

ine, weighing 35.5, is brought in contact with hydrogen it is found to combine only with one atom of that substance. When an atom of oxygen, weighing 16, comes in contact with hydrogen, however, it combines with two parts, or two atoms, of that element. An atom of nitrogen, weighing 14, combines only with three parts or three atoms of hydrogen. These elements are therefore said to possess different *atomicities;* hydrogen is called a *monatomic* element, oxygen *diatomic*, and nitrogen *triatomic*. With reference to this fact, therefore, the elements have been divided into several classes according to the number of atoms of hydrogen to which they are equivalent, or with which they can combine, and they are described as monads, diads, triads, etc. No physical explanation of the cause of this peculiarity of the different elements has yet been obtained. The idea which is made use of is that the atoms of the elements have certain points of attachment with one another, varying in number in each case. A monad is supposed to have one point of attachment, a diad two, and so on, and these have been called *bonds*. A diad, therefore, having two bonds or points of attachment, is capable of assimilating, as it were, two monads, a triad three monads. This may be represented diagrammatically by using a small circle for each atom, with one or more lines projecting from its side, according to the number of bonds or points of attachment which belong to each. More commonly, such compounds are represented by lines surrounding the ordinary symbol of the element; but as such symbols are very inconvenient in writing and printing, it is customary to express the atomicity of an element or compound by dashes attached to its ordinary symbol. Thus, monad hydrogen is H′, diad oxygen O″, triad nitrogen N‴; and when the atomicity exceeds three a small Roman numeral is employed, thus, tetratomic carbon is Civ. Experience has further shown that the atomicity of an element is capable of varying, but that the change of atomicity invariably takes place by pairs. A pentatomic element may become triatomic or monatomic, but never tetratomic or diatomic; and a tetratomic may become diatomic, but never triatomic or monatomic. This variation in atomicity has been accounted for by supposing that two atomicities in an element can neutralize or saturate one another. There are several exceptions to this rule, notably iron, which has valences of 2, 3, and 4, and mercury with valences of 1 and 2.

*Molecules.*—The molecule of a compound is the quantity of it which exists in two gaseous volumes, so that we do not speak of the atom of a compound, but of its molecule, that being the smallest quantity of a compound which can be obtained in the separate state. This and other considerations have led to the further hypothesis, that *atoms* never exist in a separate state, but that, as soon as they are separated from compounds, they enter into combination with one another. A molecule of hydrogen is therefore $H_2$, or it may be represented thus H—H, so as to indicate that the two hydrogen bonds saturate one another.

*Compound Radicals.*—In every perfect molecule all the bonds of the elements which combine are saturated, and the affinities being perfectly satisfied, the molecule has no disposition to combine directly with any other substance; but if several elements are combined in such a manner that one or more bonds remain unsatisfied, the compound so produced has in general very powerful affinities, and unites readily with any substance capable of saturating its uncombined bond. The tetratomic carbon, for example, by uniting with four atoms of hydrogen, forms the saturated molecule $CH_4$; but when carbon unites with only three atoms of hydrogen, a group, $CH_3$, is produced, containing one unsaturated bond which is capable of combining with other substances, such as chlorine, iodine, or bromine. Such a group as $CH_3$ is called a *compound radical*. Radicals of this kind are capable of forming a variety of compounds, in which their functions resemble those of an element, and viewed in this aspect an element has often been called a simple radical. A compound radical may be monad, diad, etc., according to the number of unsaturated bonds it contains.

*Classification of Compounds.*—The properties of chemical compounds may be classified not merely under the head of the particular elements they contain, but also according to their special chemical functions. The advantages of the latter method were early recognized, and the distinction between *acids* and *alkalies* dates back to a period long previous to the ascertainment of their true nature. These, and the class of *salts* which are produced by the mutual action of an acid and a base, are the most important classes of chemical compounds. An acid is now described as a compound containing a certain quantity of hydrogen, easily replaceable by a metal when it comes in contact with it either in the free state or as an oxide.

*Bases* are compounds which, by reacting on acids, yield salts. The most important bases are oxides of metals, and they are divided into several sections, of which the most important are the alkalies. These substances are the hydrates of the so-called alkaline metals, and may be compared to water in which an atom of hydrogen is replaced by an atom of metal. Most of the bases, excepting the alkalies, are insoluble in water, and without any effect on vegetable colors. Another class of bases of great importance is typified by ammonia.

*Sulphides* are compounds of an element with sulphur, and form a very important class of compounds. They are obtained either by heating the elements with sulphur in proper proportions or by passing a current of hydrosulphuric acid gas through a solution of a salt. They exist abundantly in the mineral kingdom, and form some of the most important ores. Some of the sulphides are capable of acting as bases and others as acids, and by combination a class of salts, usually distinguished as sulphur salts, can be obtained. The greater part of the sulphides are insoluble in water, and some of them possess extremely fine colors, and are used as paints.

*Organic and Inorganic Chemistry.*—Organic chemistry is that branch of the science which treats of the compounds existing in plants and animals, or which may be produced from substances found ready formed in their tissues. It was at first believed that these compounds were peculiar in their constitution, quite distinct in their chemical relations, and produced by what was called vital affinity. The discovery by Wöhler, however, that urea could be produced artificially from purely mineral substances entirely altered this view; and since then the artificial production of many organic compounds has practically annulled the distinction between organic and inorganic chemistry except as a matter of convenience. Organic chemistry is now most commonly defined as the chemistry of the carbon compounds, for that element is found in every substance which can be extracted from plants and animals, in combination with hydrogen, oxygen, nitrogen, and less frequently with sulphur and phosphorus. These elements are so combined as in many cases to form compounds of extreme complexity, the constitution of some of which is still a matter of much difference of opinion among chemists; but the constitution of the simpler organic compounds is now thoroughly understood.

**Chemnitz** (*hem'nits*), the principal manufacturing town in the kingdom of Saxony, on the Chemnitz, 39 miles southwest of Dresden. It is well built, and has a castle, a lyceum, town-hall, school of design, etc. The principal manufactures are white and printed calicoes, ginghams, handkerchiefs, woolen and half-woolen goods, etc. There are also extensive cotton-spinning mills, and mills for the spinning of combed wool and floss-silk; dye-works, print-works, bleach-works, chemical works; large manufactures of cotton hose, etc. The manufacture of machinery also has now become important. The cotton hose and woolen goods are exported to Japan, China, Africa, and America, while the machinery is chiefly destined for Russia, Silesia, and Bohemia. It has had a rapid recent progress, having now three times the population it had in 1870. Pop. 286,454.

**Chemnitz** (*hem'nits*), MARTIN, a German Protestant theologian of the 16th century, born in the mark of Brandenburg in 1522. He was educated at Wittemberg and became a schoolmaster in Wriezen on the Oder. In 1550 he became librarian of Duke Albert of Prussia, and about this time wrote his *Loci Theologici*, 1591, a learned commentary on Melanchthon's system of dogmatics. He subsequently went as a minister to Brunswick, where he died in 1586. Of his other works the most valuable is the *Examen Consilii Tridentini*.

**Chemosh** (*kē'mosh*), the national god of the Moabites, who were on that account called 'the people of Chemosh' (Num., xxi. 29; Jer., xlviii, 46). At an early period this deity appears also as the national god of the Ammonites (Judg., xi. 24), though his worship seems afterwards to have given place to that of Moloch (I Ki., xi. 5, 7), if Moloch be not merely another name for the same deity. The worship of Chemosh was even introduced among the Hebrews by Solomon, who "built an high place for Chemosh, the abomination of Moab, in the hill that is before Jerusalem" (I Ki., xi, 7).

**Chemosis** (*kē-mō'sis*), an affection of the eye, in which the conjunctiva is elevated above the transparent cornea.

**Chemother'apy.** See *Serum Therapy.*

**Chemulpo** (*chē-mul'pō*), one of the three treaty-ports of Corea, exporting beans, ginseng, etc., and importing European and American manufactures.

**Chenab** (chen-ȧb), a river of Hindustan, one of the five rivers of the Punjab. It rises in the Himalayan ranges of Kashmir, and entering the Punjab near Sialkot, flows in a southwesterly direction till it unites with the Jehlam; length about 800 miles. At Wazirabad it is crossed by a great iron railway bridge more than a mile long.

**Cheng,** a Chinese musical instrument, consisting of a series of tubes having free reeds. Its introduction into Europe led to the invention of the accordion, harmonium, and other free-reed instruments.

**Chénier** (shā-nyā), ANDRÉ-MARIE DE, a French poet, born at Constantinople in 1762, went to France when very young, and entered the army, but left shortly after his twentieth year to devote himself to literary pursuits. In 1790 he joined the moderate section of the Republicans, and made himself offensive alike to the Royalists and Jacobinical party. Being brought before the revolutionary tribunal he was condemned and guillotined July 25, 1794. The poems of Chénier are inconsiderable in number, but give the author a high place among the poets of France. His chief works are *Hermes; The Elegies; La Liberté*, etc.; and some beautiful odes, of which *La Jeune Captive*, written in prison, is perhaps the best known.

**Chénier,** MARIE JOSEPH BLAISE DE, brother of the foregoing, born Aug. 28, 1764, at Constantinople, went when very young to Paris, served as an officer of dragoons, left the service, and devoted himself to literary pursuits. His dramas *Charles IX*, *Henry VIII*, and *La Morte de Calas*, full of wild democratic declamation, were received with great applause. He was chosen a member of the Convention, where, for a considerable time, he belonged to the party of the most violent Democrats. His works comprise discourses on the history of French literature, as well as odes, songs, hymns, etc. He died in January, 1811.

**Chenille** (she-nil'), a sort of ornamental fabric of cord-like form, made by weaving or twisting together warp-threads, with a transverse filling or weft, the loose ends of which project all round in the form of a pile. Chenille carpets have a weft of chenille, the loose threads of which produce a fine, velvety pile.

**Chénonceaux** (shā-noṇ-sō). See *Bléré*.

**Chenopodiaceæ** (kē-nō-pod-i-ā'se-ē), a nat. order of apetalous exogens, consisting of more or less succulent herbs or shrubs, belonging to about eighty genera and 600 species. They are mostly innocent weeds, but several are employed as pot-herbs, such as spinach and beet, and others for the manufacture of soda. The genus *Chenopod'ium* consists of weedy plants, common in waste places, and known in Britain by the names of goosefoot, fathen, good King Henry, etc. *C. anthelminticum* is a species well known in the United States, where it is in repute as a vermifuge, under the name of wormseed, the seeds or the oil obtained from them being given as a remedy for worms. *C. Quinoa* is an important S. American species, having edible seeds, on account of which it is largely cultivated in Peru and Chile as a food-plant.

**Cheops** (kē'ops), the name given by Herodotus to the Egyptian monarch whom the Egyptians themselves called Khufu. He belonged to the rulers who had for their capital Memphis; lived about 2800-2700 B.C., and built the largest of the pyramids. According to Herodotus, he employed 100,000 men on this work constantly for 20 years.

**Chephren** (kef'ren), or CEPHRENES, was the successor of Cheops as king of Egypt, and the builder of the second pyramid. His name is properly Khafra. See *Cheops*.

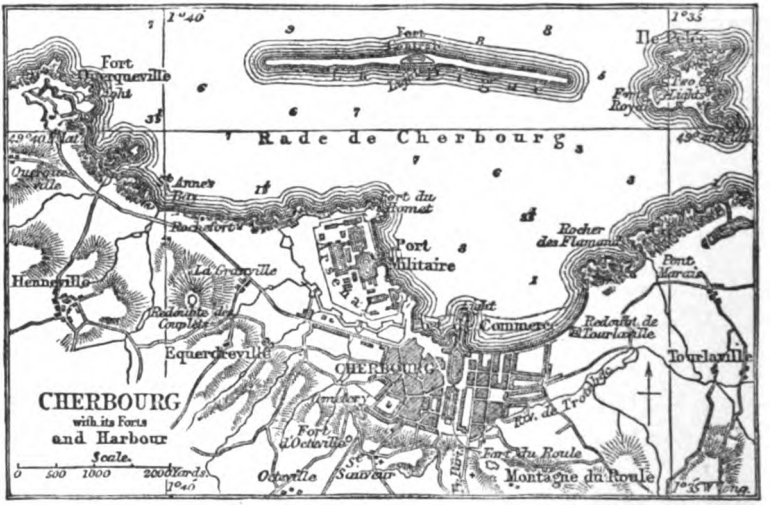
**Chepstow** (chep'stō), a town and port in England, County Monmouth, on the Wye, 14 miles N. by W. of Bristol. The high tides of the Wye allow large ships to reach the town, which is very ancient, and has a castle, portions of which date back to the Conquest. In the vicinity are the beautiful ruins of Tintern Abbey. Pop. 2953.

**Cheque,** or CHECK (chek), a draft or bill on a bank, payable on presentation. A cheque may be drawn payable to the bearer, or to the order of some one named; the first form is transferable without endorsation, and payable to any one who presents it; the second must be endorsed, that is, the person in whose favor it is drawn must write his name on the back of it. Cheques are a very important species of mercantile currency wherever there is a well-organized system of banking. The regular use of them for all payments, except of small amount, makes the transfer of funds a mere matter of cross-entries and transferring of balances among bankers, and tends greatly to economize the use of the precious metals as a currency.

**Chequy,** or CHEQUERED. See *Heraldry.*

**Cher** (shār), a river of Central France, a tributary of the Loire, which it enters near Tours; length, 200 miles.

**Cher** (shār), a department of Central France, named from the river Cher, and formed from part of the old provinces of Berry and Bourbonnais; area, 2819 square miles; capital, Bourges. The surface is in general flat, but is diversified in the N. by chains of inconsiderable hills. Soil various, but fertile in the neighborhood of the Loire and Allier. The forests and pastures are extensive. More grain and wine are produced than the demands of the inhabitants require. The preparation and manufacture of iron, called Berry iron, is the principal branch of industry. The department is divided into three arrondissements. Pop. (1906) 343,484.




**Cherbourg** (shār-bŏr), a fortified seaport and naval arsenal of France, in the department of La Manche, 196 miles W. N. W. Paris. The fortifications are very extensive, and have been greatly strengthened in recent years, so that Cherbourg, if not impregnable from the sea, is at least very difficult of attack. The port is divided into the commercial and naval ports, which are quite distinct. The Port Militaire is accessible at all times of tide for vessels of the largest class; there are slips for vessels of the largest dimensions, dry docks, building-sheds, mast-houses, boiler-works, and in short everything necessary for the building and fitting out of ships of war. There is a great *digue* or breakwater, stretching across the roadstead, which, though protected on three sides by the land, was formerly open to the heavy seas from the north. The *digue* was commenced under Louis XVI, is 4120 yards long, and is 2¼ miles from the harbor, in water varying from 42 to 62 feet deep. A fort and lighthouse occupy the center of the *digue*, and there are circular forts at the extremities. The principal industry of the town is centered in the works of the dockyard, the commercial trade and manufactures being comparatively insignificant. Large quantities of eggs are shipped for England. Cherbourg occupies the site of a Roman station. William the Conqueror founded a hospital in it, and built the castle church. The castle, in which Henry II frequently resided, was one of the strongholds of Normandy. The town was taken by the British in 1758. Pop. (1906) 35,710.

**Cherbury,** LORD. See *Herbert, Edward.*

**Cheribon** (sher'i-bon), a seaport on the island of Java, capital of the province of the same name. The province lies on the coast towards the N. W., produces coffee, timber, arecanuts, indigo and sugar, and has about 1,577,521 inhabitants. The town lies in a deep bay on the north coast, and is the residence of a Dutch governor. Pop. 18,495.

**Cherimoyer** (c h e r-i-m o i'e r), the fruit of the *Anona Cherimolia*, a native of S. and Central America, allied to the custard-apple. It is a heart-shaped fruit with a scaly exterior, and numerous seeds buried in a delicious pulp. Both flowers and fruit emit a pleasant fragrance. This fruit is now cultivated in various tropical regions.

**Cherkask'.** See *Tcherkask.*

**Cher'nigov.** See *Tchernigov.*

**Cherokees** (cher-ō-kēz'), a tribe of North American Indians in the United States, occupying an allotted region in Oklahoma. Their old seats were in Georgia, Alabama, Mississippi and Tennessee. The Cherokees are the most enlightened of the Indian tribes, have invented an alphabet, printed books and newspapers in their own language, live in well-built villages, and have an excellent school system. Their numbers are about 20,000.

**Cheroot** (she-rōt'). See *Cigar.*

**Cherry** (cher'i), a fruit-tree of the prune or plum tribe, very ornamental and therefore much cultivated in shrubberies. It is a native of most temperate countries of the northern hemisphere. The cultivated varieties probably belong to two species, *Cerăsus avium* and *Cerăsus vulgăris*, the genus *Cerasus* being considered a subgenus of *Prunus*. They are numerous, as the red or garden cherry, the red heart, the white heart, the black heart, etc. The fruit of the wild cherry, or *gean*, is often as well flavored, if not quite so large, as that of the cultivated varieties. It is said that the cherry was originally brought from Cerasus, in Pontus, to Italy, by Lucullus, about B.C. 70, and introduced into England by the Romans about A.D. 46. The cherry is used in making the liqueurs Kirschwasser and Maraschino (which see). The wood of the cherry-tree is hard and tough, and is very serviceable to turners and cabinet-makers. An ornamental but not edible species is the bird-cherry (which see). The American wild cherry (*Cerăsus Virginiāna*), is a fine large tree, the timber of which is much used by cabinet-makers and others, though the fruit, growing in clusters, is bitter and rather astringent. It is famous for its medicinal bark.

**Cherry-laurel,** the common name of *Cerăsus Laurocerăsus*, nat. order Rosaceæ, an evergreen shrub, a native of Asia Minor, but now naturalized in the United States and common in shrubberies. It is commonly called laurel, but must not be confounded with the sweet-bay or other true species of laurel. The leaves yield an oil nearly identical with that got from bitter almonds. The distilled water (called 'laurel water') from the leaves is used in medicine in the same way as diluted hydrocyanic or prussic acid. It is poisonous in large doses. The Portugal laurel is another species.

**Cherso** (ker'so), an island in the Adriatic belonging to Austria, yielding wine, olives and other fruits, and having a pop. of about 8274. It contains a town of same name; pop. 4670.

**Cherson** (*h*er'son). See *Kherson.*

**Chersonesus** (k e r-so-nē'sus; Greek, 'a peninsula'), anciently a name applied to several peninsulas, as the Cimbrian Chersonesus (*Chersonesus Cimbrica*), now Jutland, etc., the Tauric Chersonesus (*Ch. Taurica*), the peninsula formed by the Black Sea and the Sea of Azoff—the Crimea.

**Chert** (chėrt), a variety of quartz, called also *Hornstone* or *Rock-flint.* It is less hard than common quartz, and is usually amorphous, sometimes globular or in nodules. Siliceous concretions occurring as nodules and layers in limestone rocks are also called chert.

**Chertsey** (chėrt'si), a town of England, in Surrey, 20 miles S. W. of London, on the Thames, giving name to a parl. div. of the county. The Saxon kings had a palace here. Bricks and tiles are made, and vegetables largely cultivated. Pop. 13,819.

**Cherub** (cher'ub; in the plural *Cherubs* and *Cherubim*), one of an order of angels variously represented at different times, but generally as winged spirits with a human countenance, and distinguished by their knowledge from the seraphs, whose distinctive quality is love. The first mention of cherubs is in Gen. iii, 24. The cherubs in Ezekiel's vision had each four heads or faces, the hands of a man, and wings. The four faces were the face of a bull, that of a man, that of a lion, and that of an eagle. (Ezek., iv and x.) In the celestial hierarchy cherubs are represented as spirits next in order to seraphs.

**Cherubini** (kā-rō-bē'nē), MARIA LUIGI CARLO ZENOBIO SALVATORE, an eminent Italian composer born at Florence in 1760. His first opera, *Quinto Fabio*, was produced in

Alessandria in 1780, and in Rome (in an altered form) in 1783, with such success as to spread his fame over Italy. After visiting London he finally settled in Paris, where he became director of the École Royale in 1822, and died in 1842. Among his compositions are *Iphigenia in Aulide*, *Lodoiska*, *Faniska*, *Les Deux Journées*, etc. In his later years he confined himself almost exclusively to the composition of sacred music, and gained a lasting fame by his *Coronation Mass*, and more especially his gorgeous *Requiem*.

**Cherusci** (ke-rus'sI), an ancient German tribe, whose territory probably was situated in that part of Germany lying between the Weser and the Elbe, and having the Harz Mountains on the N. and the Sudetic range on the S. This tribe was known to the Romans before 50 B.C., and occasionally served in the Roman armies. But when Varus attempted to subject them to the Roman laws they formed a confederation with many smaller tribes, and having decoyed him into the forests, destroyed his whole army in a battle which lasted three days, and in which he himself was slain (A.D. 9). Upon this the Cherusci became the chief object of the attacks of the Romans. Germanicus marched against them, but though successful in several campaigns did not obtain any permanent advantages. Subsequently the Cherusci were overcome by the Chatti, and latterly they were incorporated among the Franks.

**Chervil** (cher'vil), the popular name of umbelliferous plants of the genus *Chærophyllum*, but especially of *C. temŭlum*, the only British species, a hairy weed with longish, grooved fruits. Garden chervil is *Anthriscus cerefolium*, an umbelliferous plant much used in soups and salads in some European countries. The parsnip chervil (*A. bulbōsus*) has a root like a small carrot, with a flavor between that of a chestnut and a potato. Sweet chervil, sweet cicely, or myrrh is *Myrrhis odorāta*, an aromatic and stimulant umbellifer formerly used as a pot-herb, growing in a semiwild state in Britain.

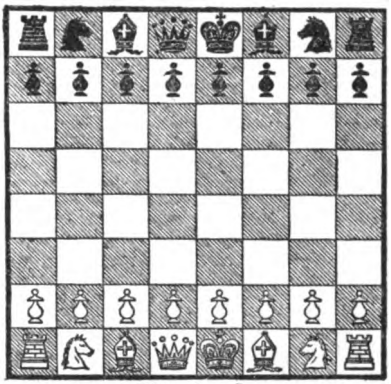
**Chesapeake Bay** (ches'a-pēk), a spacious bay of the United States, in the states of Virginia and Maryland. Its entrance is between Cape Charles and Cape Henry, 16 miles wide, and it extends 180 miles to the northward. It is from 10 to 30 miles broad, and at most places as much as 9 fathoms deep, affording many commodious harbors and a safe and easy navigation. It receives the Susquehanna, Potomac, York and James Rivers and supplies a route to the sea for the commerce of Baltimore, Washington, Norfolk and Richmond. Off Norfolk lies the fine harbor of Hampton Roads, the scene of the famous battle between the *Monitor* and *Merrimac*. The oyster fisheries of Chesapeake Bay are the finest in the country, and its large numbers of wild fowl, especially the famous canvas-back duck, make it a favorite resort for sportsmen.

**Cheselden** (ches'el-den), WILLIAM, an English surgeon and anatomist, born in Leicestershire in 1688, went to London to prosecute his studies, and at the age of twenty-two began to give lectures on anatomy. In 1713 he published a treatise on the *Anatomy of the Human Body*, long esteemed as a manual of the science. In 1723 he published a *Treatise on the High Operation for the Stone*, and afterwards added to his reputation by operating for stone. In 1733 was published his *Osteography, or Anatomy of the Bones*, folio, consisting of plates and short explanations, a splendid and accurate work. He died at Bath in 1752.

**Cheshire** (chesh'ir), or CHESTER, a maritime county and county palatine of England, bounded by the counties of Lancaster, York, Derby, Stafford, Salop, Denbigh, Flint, the estuaries of the Dee and Mersey, and the Irish Sea. The area is 1027.8 sq. miles, of which only a sixteenth is uncultivated. The surface is generally level, the soil mostly a rich reddish loam variously clayey or sandy. There is some of the finest pasture land in England; and cheese, the main produce of the Cheshire farmer, is made in great quantities. Extensive tracts of land are cultivated as market-gardens, the produce being sent to Liverpool, Manchester, and other towns. Minerals abound, especially rock-salt and coal, which are extensively worked. Cotton manufacture is carried on at Stockport, Stalybridge, and the northeastern district, shipbuilding at Birkenhead and other places. Trade is facilitated by numerous railway lines and a splendid system of canals. The chief rivers are the Mersey, and Dee and the Weaver. Small sheets of water called *meres* are numerous. Cheshire has eight parliamentary divisions, each returning one member. Principal towns, Chester, the county town, Macclesfield, Stockport, Birkenhead and Stalybridge. Pop. (1911) 676,356.

**Chess**, a well-known game of great antiquity and of eastern ori-

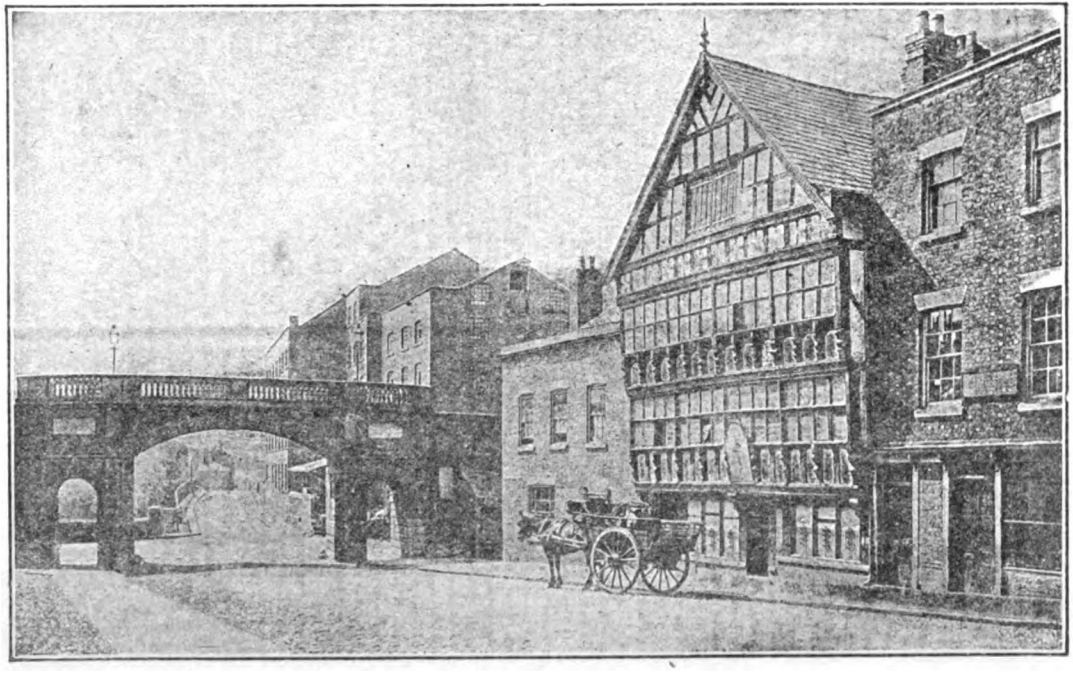
gin, having probably arisen in India, and thence spread through Persia and Arabia to Europe. The game is played by two persons, on a board consisting of sixty-four squares arranged in eight rows of



Chess-board.

eight squares each, alternately black and white. Each player has sixteen men, eight of which, known as *pawns*, are of the lowest grade; the other eight, called *pieces*, are of various grades. They are, on each side, *king* and *queen;* two *bishops*, two *knights*, and two *rooks* or *castles*. The board must be placed so that each player shall have a white square to his right hand. The men are then set upon the two rows of squares next the players; the pieces on the first, the pawns on the second row, leaving four unoccupied rows in the center. The king and queen occupy the central squares facing the corresponding pieces on the opposite side. The queen always occupies her own color, white queen on white square, black on black. The two bishops occupy the squares next the king and queen; the two knights the squares next the bishops; the rooks the last or corner squares. The pawns fill indiscriminately the squares of the second or front row. The men standing on the king's or queen's side of the board are named respectively king's and queen's men. Thus king's bishop or knight is the bishop or knight on the side of the king. The pawns are named from the pieces in front of which they stand; king's pawn, king's knight's pawn, queen's rook's pawn, etc. The names of the men are contracted as follows:— King, K; King's Bishop, K.B.; King's Knight, K.Kt.; King's Rook, K.R.; Queen, Q.; Queen's Bishop, Q.B.; Queen's Knight, Q.Kt.; Queen's Rook, Q.R. The pawns are contracted: K.P., Q.P., K.B.P., Q.Kt.P., etc. The board is divided into eight files running longitudinally from one player to the other, and laterally into eight ranks or rows. Each file is named from the piece which occupies its first square, and counting inversely from the position of each player to that of the other, the rows are numbered from 1 to 8. At White's right-hand corner we have thus K.R. square; immediately above this K.R.2; and so on to K.R. 8, which completes the file; the second file begins with K.Kt. square on the first row, and ends with K.Kt. 8 on the eighth. White's K.R. 8 and K.Kt. 8 are thus Black's K.R. square, and K. Kt. square, and the moves of each player are described throughout from his own position, in inverse order to the moves of his opponent.

In chess all the men capture by occupying the position of the captured man, which is removed from the board; the only exception to this rule is the *en passant* capture by the pawn, which will be explained later. The ordinary move of the *Pawn* is straight forward in the same file; a pawn never moves backward. The first time a P. is moved it may be played forward one square or two; afterwards only one square at a time. But in capturing an adverse piece the P. moves diagonally one square to occupy the position of the captured man. Thus if White open a game by playing P. to K. 4 and Black answers P. to K. 4, the pawns are immovable; but if White now plays P. to K.B. 4 or P. to Q. 4, Black may capture the P. last advanced. Pawns have another mode of capture peculiar to themselves, known as the *en passant* capture, which is only available against pawns. If Black's P., instead of occupying K. 4, stood on K. 5, and White played P. to Q. 4, Black could not capture it by placing his P. on the square it occupies, which would be a false move; but he is at liberty to make the capture by placing his own P. on the square passed over by White's (Q. 6). The privilege of capturing *en passant* has two important limitations: (1) the P. to be captured must have moved *two* squares on its initial move, and (2) the capture must be made *immediately after* it has moved; if other moves intervene the privilege is lost. When a P., by moving or capturing, reaches the eighth square of any file it can no longer remain a P., but must at once be exchanged for a piece of the same color. The player may choose any piece except the king; but



IN OLD CHESTER, ENGLAND

the queen, the most valuable piece, is generally the piece chosen. This is called *queening* a pawn, and a player may thus have several queens on the board. *The Rook.*—The moves of the pieces are not, like those of the pawns, limited to a single direction. The R. moves in any direction and for any distance that is open along either the particular row or the file on which it happens to stand. It can, of course, capture any obstructing opposing piece or pawn and occupy its place. *The Bishop.*—The B.'s move diagonally, either backward or forward, and can never change the color of their square. Like the R.'s, their range is only limited by the extent to which their path is open or unobstructed; a B. may also capture an obstructing opponent. *The Queen.*—The Q. combines the moves of the R. and B. She is the most powerful piece on the board, and can move to, or capture at, any distance or direction in a straight line. *The King.*—The K. is at once the weakest and the most valuable piece on the board. In point of direction he is as free as the queen, but for distance he is limited to the adjacent squares. Standing on any central square he commands the eight squares around him and no more. Besides his ordinary move the K. has another by special privilege, in which the R. participates. Once in the game, if the squares between K. and R. are clear, if neither K. nor R. has moved, if K. is not attacked by any hostile man, and if no hostile man commands the square over which K. has to pass, K. may move two squares towards either K.R. or Q.R., and R. in the same move must occupy the square over which K. has passed. This is called *castling. The Knight.*—The Kt., unlike the other pieces, never moves in a straight line. His move is limited to two squares at a time, one forwards, backwards or sideways, and one diagonally, and he can leap over any man occupying a square intermediate to that to which he intends to go. All captures in chess are optional.

The definite aim in chess is the reduction to surrender of the opposing king. The K. in chess is supposed to be inviolable, that is, he cannot be taken, he can only be in such a position that if it were any other piece it would be taken. Notice of every direct attack upon him must be given by the adversary saying *check*, and when the K. is attacked all other plans must be abandoned, and all other men sacrificed, if necessary, either to remove him from danger, interpose another man, or capture the assailant. It is also a fundamental rule of the game that the K. cannot be moved into check. When the K. can no longer be defended on being checked by the adversary, either by moving him out of danger, or by interposing another man, or by capture of the attacking man the game is lost, and the adversary announces this by saying *checkmate.* When, by inadvertence or lack of skill, a player blocks up his opponent's K. so that it cannot move without going into check, and no other man can be moved without exposing him, the player reduced to this extremity cannot, without violating the fundamental rule referred to, play at all. In such a case, the one player being unable to play and the other out of turn, the game is considered *drawn*, that is, concluded without advantage to either player.

**Chest,** in man and the higher vertebrates, the cavity formed by the breast-bone in front and the ribs and backbone at the sides and behind, shut off from the abdomen below by the diaphragm or midriff. It contains the heart, lungs, etc., and the gullet passes through it. See *Thorax.*

**Chester** (ches'ter), an English parliamentary and municipal borough, county town of Cheshire, situated on the Dee about 16 miles from Liverpool. It is a bishop's see, and contains an old and interesting cathedral recently restored. The four principal streets have the roadways sunk considerably below the level of the footways, which run within piazzas covered by the upper portion of the houses, and in front of the ranges of shops. Flights of steps at convenient distances connect the carriageways with the footways or 'rows.' There are also shops and warehouses below the rows. These features, together with the ancient walls (now a public promenade) and the quaintly-carved wooden gables of many of the houses, give an antique and picturesque appearance to Chester. Chester has manufactories of lead pipes, boots and shoes, iron-foundries, chemical works, etc. The port has been improved of late years, and there is a considerable amount of shipping on the Dee. Pop. (1911) 39,038.

**Chester,** a city of Pennsylvania, on the Delaware, 15 miles below Philadelphia, with which it is connected by steam and electric railways. It was settled by the Swedes in 1653 and is the oldest town in the State, its Swedish name being Upland. Within recent years it has grown rapidly and become the seat of large manufacturing

establishments, including extensive steel works, textile mills, and various other industries. It has a good river harbor and considerable commerce. Pop. 38,537.

**Chesterfield** (ches'ter-fēld), a town of England, in Derbyshire, 24 miles N. of Derby, irregularly but substantially built. The principal manufactures are ginghams, lace and earthenware. It gives name to a parliamentary division of the county. Pop. (1911) 37,429.

**Chesterfield,** PHILIP DORMER STANHOPE, EARL OF, an English statesman and author, was born in London in 1694, and died in 1773. On the accession of George I (1714) he became Gentleman of the Bedchamber to the Prince of Wales, and was returned by the borough of St. Germains, in Cornwall, to parliament. He succeeded his father in the title in 1726, sat in the House of Lords, and acquired some distinction as a speaker. In 1728 he was ambassador to Holland, in 1744 lord-lieutenant of Ireland, a position which he occupied with great credit, and in 1746 secretary of state; but in 1748 retired from public affairs. He obtained some reputation as an author by essays and a series of letters to his son. These writings combine wit and good sense with great knowledge of society.

**Chester-le-Street,** a town of England, in the county of and 5 miles N. of Durham, giving name to a parliamentary division of the county. It has coal-mines and iron-works. Pop. (1911) 14,713.

**Chesterton,** GILBERT KEITH, an English journalist and author, born at Campden Hill, Kensington, in 1874; was educated at St. Paul's School; attended classes at the Slade School, and began his career by reviewing art books. He has contributed to many different periodicals and has written a number of books, including *Browning* (English Men of Letters); *Heretics* (1905); *Dickens* (1906); *Orthodoxy* (1908); *Tremendous Trifles* (1909); *What's Wrong with the World* (1910); *A Miscellany of Men* (1912).

**Chest-foundering,** a disease in horses, a rheumatic affection of the muscles of the chest and forelegs, impeding both respiration and the motion of the limbs.

**Chestnut** (ches'nut), a genus of plants, order Cupuliferæ, allied to the beech. The common or Spanish chestnut (*Castānea vesca*) is a stately tree, with large, handsome, serrated, dark-green leaves. The fruit consists of two or more seeds enveloped in a prickly husk. Probably a native of Asia Minor, it has long been naturalized in Europe, and was perhaps introduced into Britain by the Romans. Chestnuts form a staple article of food among the peasants of Spain and Italy. The timber of the tree is inferior to that of the oak, though similar in appearance. Two American species of chestnuts, *C. Americāna* and *C. Pumila* or *chinkapin* (the latter a shrub), have edible fruits smaller than the fruit of the European tree.—The name of Cape Chestnut is given to a beautiful tree of the rue family, a native of Cape Colony.—The Moreton Bay Chestnut is a leguminous tree of Australia. *Castanospermum Australe*, with fruits resembling those of the chestnut.—The water-chestnut is the water-caltrop, *Trapa natans*. *See Caltrop.*—The horse-chestnut (which see) is quite a different tree from the common chestnut.

Chestnut (*Castanea vesca*).

**Chetah** (chē'ta), the *Felis jubāta* or *Cynailūrus jubātus*), or hunting leopard of India, a native of Asia and Africa. It has its specific name (*jubāta*, crested or maned) from a short mane-like crest at the back of the head. When used for hunting it is hooded and placed in a car. When a herd of deer is seen, its keeper places its head in the proper direction and removes its hood. It is about the size of a large greyhound, has a catlike head, but a body more like a dog's. A slightly different form inhabits Africa, distinguished as a different species, though with only trivial variations.

**Chettik** (chet'tik), a tree of Java, the *Strychnos Tieuté*, yielding a very virulent poison called by the same name, owing its virulence to the strychnine it contains.

**Chetvert** (chet'vert), a Russian grain-measure, equal to 0.7218 of an imperial quarter, or 5.77 bushels.

**Cheval,** A (à shė-vàl; French), on horseback, astride any object. The troops are said to be arranged *à cheval* when they are placed so as to command two roads, two banks of a river, etc.

**Cheval-glass** (shė-val'), a swing looking-glass mounted on a frame, and large enough to reflect the whole figure.

**Chevalier** (shė-vȧ-lyā), MICHEL, a celebrated economist, born at Limoges in France, in 1806. He was educated as an engineer in the School of Mines, joined the St. Simonians, and suffered six months' imprisonment for promulgating the free doctrines of Père Enfantin's party. On his liberation M. Chevalier renounced his extreme doctrines, and was sent to the United States and to England on special missions. He became a councilor of state (1838), professor of political economy in the Collège de France (1840), member of the chamber of deputies (1846), and member of the Institute (1851). By this time he had written a number of works: *Lettres sur l'Amerique du Nord; Des Intérêts Matériels en France; Essais de Politique Industrielle; Cours d'Economie Politique*, etc. He was known as a strong advocate of free trade and as a specialist on questions of currency. Along with Cobden and Bright he had a great part in the commercial treaty of 1860 between France and Britain. He died in 1879.

**Chevaux-de-frise** (shė-vō' dė frēz; 'friesland horses,' so called because first used at the siege of Groningen, in that province, in 1658), contrivances used in warfare, consisting of long pieces of timber or iron forming a center, with long, sharp-pointed spikes projecting all round, placed on the ground and serving to defend a passage, stop a breach, etc.

**Cheviot Hills** (chē'vi-ot, or chev'i-ot), a range on the borders of England and Scotland, stretching S. W. to N. E. for above 35 miles; culminating point, the Cheviot, 2688 ft. They are clothed for the most part with a close green sward, and are pastured by a celebrated breed of sheep.

**Cheviot Sheep,** a variety of sheep, taking their name from the well-known Cheviot mountain range, noted for their large carcass and valuable wool, which qualities, combined with a hardiness second only to that of the black-faced breed, constitute them the most valuable race of mountain sheep in Britain. The fleece weighs from 3 to 4 lbs., and the carcass of ewes varies from 12 to 16 lbs. per quarter, that of wethers from 16 to 20 lbs.

**Chevreul** (shė-vreul), MICHEL EUGÈNE, a French chemist, born in 1786. In 1813 he became professor of physical science in the Charlemagne Lyceum, in 1824 director of dyeing in the Gobelins manufactory, in 1830 professor of chemistry in the Collège de France. In 1879 he retired. He wrote various works on chemistry and dyeing, and an important work on the *Principles of Harmony and Contrast of Colors*, translated into English. He died in 1889.

**Chevron** (shev'ron), a heraldic and ornamental form, variously used. In heraldry, the chevron is an ordinary supposed to represent two rafters meeting at top. It is one of charges called honorable ordinaries, and is usually placed as shown in the accompanying cut. Chevrons of various forms are used in several armies as the distinguishing badge worn on the sleeve of a non-commissioned officer. In architecture, the *chevron moulding* consists of a variety of fret ornament of a zigzag form, common in Norman architecture.

Chevron.

Chevron Molding.

**Chevrotain** (shev'ru-tān; *Tragŭlus pygmœus*), a species of small musk-deer found in India and Southeastern Asia and the islands.

**Che'vy Chase,** the name of a celebrated British border ballad, which is probably founded on some actual encounter which took place between its heroes, Percy and Douglas, although the incidents mentioned in it are not historical. On account of the similarity of the incidents in this ballad to those of *The Battle of Otterbourne*, the two ballads have often been confounded; but the probability is that if any historical event is celebrated at all in the ballad of *Chevy Chase*, it is different from that celebrated in *The Battle of Otterbourne*, and that the similarity between the two ballads is to be ex-

plained by supposing that many of the events of the former were borrowed from the latter. There are two versions of the ballad bearing the name of *Chevy Chase*, an older one, originally called *The Hunting of the Cheviot*, and a more modern one. From the fact that the older version is mentioned in the *Complaynt of Scotland*, written in 1548, it is clear that it was known in Scotland before that time. The age of the more modern version is believed to be no later than the reign of Charles II. This is the version which forms the subject of the critique by Addison in Nos. 70 and 74 of the *Spectator*.

**Cheyenne** (shī-ăn'), capital of the State of Wyoming and county seat of Laramie county; on the eastern slope of the Rocky Mountains; elevation, 6050 feet above sea level; on the main line of the Union Pacific, the Burlington, the Denver Pacific and the Cheyenne and Northern. The Union Pacific shops are located here; also the state armory and arsenal. There is an army post (Fort D. A. Russell) three miles from the city. Immense oil fields and mountains of iron ore surround Cheyenne on the north; great coal mines are located north and west of the city. Pop. 16,320. The river Cheyenne, a tributary of the Missouri, is formed by two branches, rising in Wyoming.

**Cheyenne Indians,** a warlike branch of the Algonquin stock of American Indians, originally on the Red River of the North, later on the Cheyenne River in Wyoming and as far south as the Arkansas. During the Civil war and until 1867 the government had frequent wars and other troubles with them. They now form part of the Indian population of Oklahoma.

**Chiabrera** (ki-ä-brā'rä), GABRIELLO, an Italian poet, born in 1552; died in 1637; wrote various kinds of poems, and imitated Pindar and Anacreon in odes and canzonets, not unsuccessfully.

**Chiana** (kē-ä'nä; anciently *Clanis*), a river and valley of Italy, in Tuscany and Umbria. The river is artificially divided into two branches, the one flowing into the Arno, the other into the Paglia. By works begun in 1551 and completed only in 1823 the valley of the Chiana has been drained and brought under cultivation, being now one of the most productive portions of Italy.

**Chianti** (kē-ăn'tē), a district in Italy, near Siena, where what is now the best-known red wine of Italy is produced. Chianti wine is full flavored and astringent, with an alcoholic strength of about 20 per cent.

**Chian Turpentine** (kī-an), a turpentine or resin obtained from the island of Chios (Scio), yielded by *Pistachia Terebinthus*, a native of the Mediterranean islands and shores, used in medicine. Called also Cyprus turpentine.

**Chiapas** (chē-ä'pȧs), a state of the Mexican Confederation, area 27,222 square miles. It is in many parts mountainous, is intersected by several considerable streams, and covered with immense forests. They are rich in minerals, including gold. The valleys are fertile, and produce much maize, sugar, cacao and cotton, etc. But trade is quite undeveloped on account of the lack of roads. The capital is Tuxtla Gutierrez. In this state are the famous mines of Palinque. Pop. (1910) 436,817.

**Chiaramonte** (ke-ä-rä-mo n't ā), a town of Sicily, province Syracuse, on a hill in a highly fertile neighborhood. Pop. 10,460.

**Chiari** (kē-ä'rē), a town of N. Italy, province of and 14 miles w. Brescia, with manufactures of silk. Pop. 11,000.

**Chiaroscuro** (ki-ä-ros-kō'rō; an Italian term, meaning 'clear-obscure'; in French, *clair-obscur*), in painting, the distribution of the lights and shadows in a picture. A composition, however perfect in other respects, becomes a picture only by means of the chiaroscuro which gives faithfulness to the representation, and therefore is of the highest importance for the painter. The drawing of a piece may be perfectly correct, the coloring may be brilliant and true, and yet the whole picture remain cold and hard. By the chiaroscuro objects are made to advance or recede from the eye, produce a mutual effect, and form a united and beautiful whole.

**Chiastolite** (kī-as'tō-līt), a mineral, a silicate of aluminium, having crystals arranged in a peculiar manner. The form of the crystals is a four-sided prism, whose bases are rhombs differing little from squares, but each crystal, when viewed at its extremities or on a transverse section, is obviously composed of two very different substances, and its general aspect is that of a black prism passing longitudinally through the axis of another prism which is whitish.

**Chiavari** (ki-ä'vȧ-rē), a seaport town, Italy, in the province of Genoa, 23 miles E. by S. of Genoa, in

a district productive of wines, olives and silk. Pop. 10,397.

**Chiavenna** (kē-ȧ-ven'nȧ), a town of Italy, province of Sondrio, Lombardy, 38 miles N. N. W. of Bergamo. It lies in a valley in the midst of magnificent scenery on the road to the Splügen Pass, and has an important transit trade. Pop. 3211.

**Chibchas** (chib'chȧuz), a nation of semicivilized Indians, who formerly occupied the region about the headwaters of the Magdalena River, S. America, while branches extended widely through the area of the present state of Colombia. They are of interest for their abundant and striking archæological relics. These include neatly built small stone temples, large carved images, rock paintings and carvings with figures of men and animals and various others. Their burial places contain gold and silver ornaments in considerable quantity, $50,000 worth of gold being found in a single mound. Their gold vases surpass in beauty of form any found elsewhere in America.

**Chibouque** (shi'bŏk), a Turkish pipe with a long stem.

**Chica** (chē'kȧ), a red coloring matter which the Indians on the upper parts of the Orinoco and the Rio Negro prepare from the leaves of a plant native to that region called *Bignonia Chica*, and with which they paint their skin, in order to be better able to resist the rays of the sun. See *Bignonia*.

**Chica** (chē'kȧ), a kind of beer made from maize, in general use in Chile, Peru, and elsewhere in the mountainous regions of South America. The usual method of preparing it is to steep the maize till it begins to grow, when it is exposed to dry in the sun. The malt thus prepared is then ground, mixed with warm water, and left to ferment. The beer, when ready, has a dark-yellow color, and a pleasant and somewhat bitter and sour taste, and is very intoxicating. Sometimes the Indians, instead of grinding the malt, chew it, and this variety of the liquor is considered the best. It is the national drink of the Indians, and consumed by them in great quantities. *Pito* and *poso* are other names for it.

**Chicacole,** or CHIKAKOL (chik'ȧ-kōl'), a town of India, in the Ganjam district, Madras Presidency, 567 miles N. E. of Madras, notable for its fine muslin manufactures. Pop. 18,196.

**Chicago** (shi-kȧ'gō), a city of Illinois, the second largest in the United States, is seated on the southwest shore of Lake Michigan and on both sides of Chicago River. It stands on a level plain, and is surrounded by a fertile country. The Chicago River and its two branches separate the city into three unequal divisions, known as the North, the South and the West, connected by numerous bridges and three tunnels under the river. The streets are wide and are laid out at right angles, many of them being adorned by rows of fine forest trees. The city measures 26½ miles in extreme length along the lake and from 6 to 14 in breadth. Of this the business center occupies less than a mile square. It contains most of the railroad stations, the post-office, court-house, art-institute, theaters, banks, principal hotels and stores, etc. The site of the city was originally unhealthy from its lowness, but a large portion of it has been artificially heightened (even while occupied by buildings) by 8 or 10 feet. Among the chief buildings are the new city-hall and court-house, the custom-house and post-office and the chamber of commerce. There is a university, which of recent years has had a great growth, and a large number of high-class colleges and seminaries. To supply the town with water tunnels have been constructed which extend from two to four miles under Lake Michigan, and convey the pure water of the lake into the town, where it is pumped up to a height of 160 feet and distributed. There are also a number of artesian wells. From its position at the head of the great chain of the American lakes and at the center of a network of railroads communicating with all parts of the Union, Chicago has always been more a commercial than a manufacturing city. There are extensive docks, basins, and other accommodation for shipping. The industries embrace iron-founding, brewing, distilling, leather, hats, sugar, tobacco, agricultural implements, steam-engines, boots and shoes. In commerce Chicago is second only to New York. It has an enormous trade in pork-packing, and is the greatest market for grain and timber in America. Other articles for which it is a center of trade are flour, provisions, wool, hides and clothing. It is practically the transportation center of the continent, over 100,000 miles of railroad centering here, while the great lakes afford a splendid channel for inland navigation. The great feature of the business of Chicago is its enormous dealings in foodstuffs. The Union Stock Yards, in the S. W. section of the city, are the largest in the world, cov-

ering over 400 acres of area and having accommodations for 75,000 cattle, 300,000 hogs, 80,000 sheep and 6000 horses. Immense quantities of meat are shipped from this point to every quarter of the globe, those of dressed beef alone amounting annually to more than 1,000,000,000 pounds. Here is also the greatest grain market in the world, approximately half the total supply of grain received at the eight leading grain markets of the country being handled here. Chicago was the pioneer in the construction of the lofty steel-frame business buildings now so common and known as 'sky-scrapers.' The Masonic Temple, one of the early examples of these, is 22 stories high and can accommodate 5000 occupants. There is a magnificent park system, embracing a considerable number of parks circling round the city from the lake and connected by parked boulevards 26 miles long. It is in contemplation to add to these by a number of diagonal boulevards traversing the city outward from its business center. To prevent the contamination of the water supply by the sewage of a city of so great extent if poured into the lake, a great drainage canal has been constructed from the Chicago River to Joliet on the Desplaines River, a distance of 30 miles. This has a minimum depth of 22 feet and for 10 miles is 200 feet wide and 35 feet deep. By its aid the sewage, diluted with lake water, is conveyed to the Mississippi, and the canal may ultimately be used as a shipping route from Lake Michigan to New Orleans.

Chicago has many public buildings noteworthy for architectural beauty, among them the Art Institute, the Public Library and the Newberry Library, while the Auditorium is one of the largest and best appointed public halls in the country. The Coliseum on South Wabash Street, the scene of national conventions and other gatherings, and the International Amphitheater at the Stock Yards, are the largest public halls in the city. The Field Museum of Natural History has a large and admirable collection. The University of Chicago has erected a handsome group of English Gothic buildings on the South Side, near Jackson Park. The finest residence streets are the Lake Shore Drive of the North Side and the boulevards.

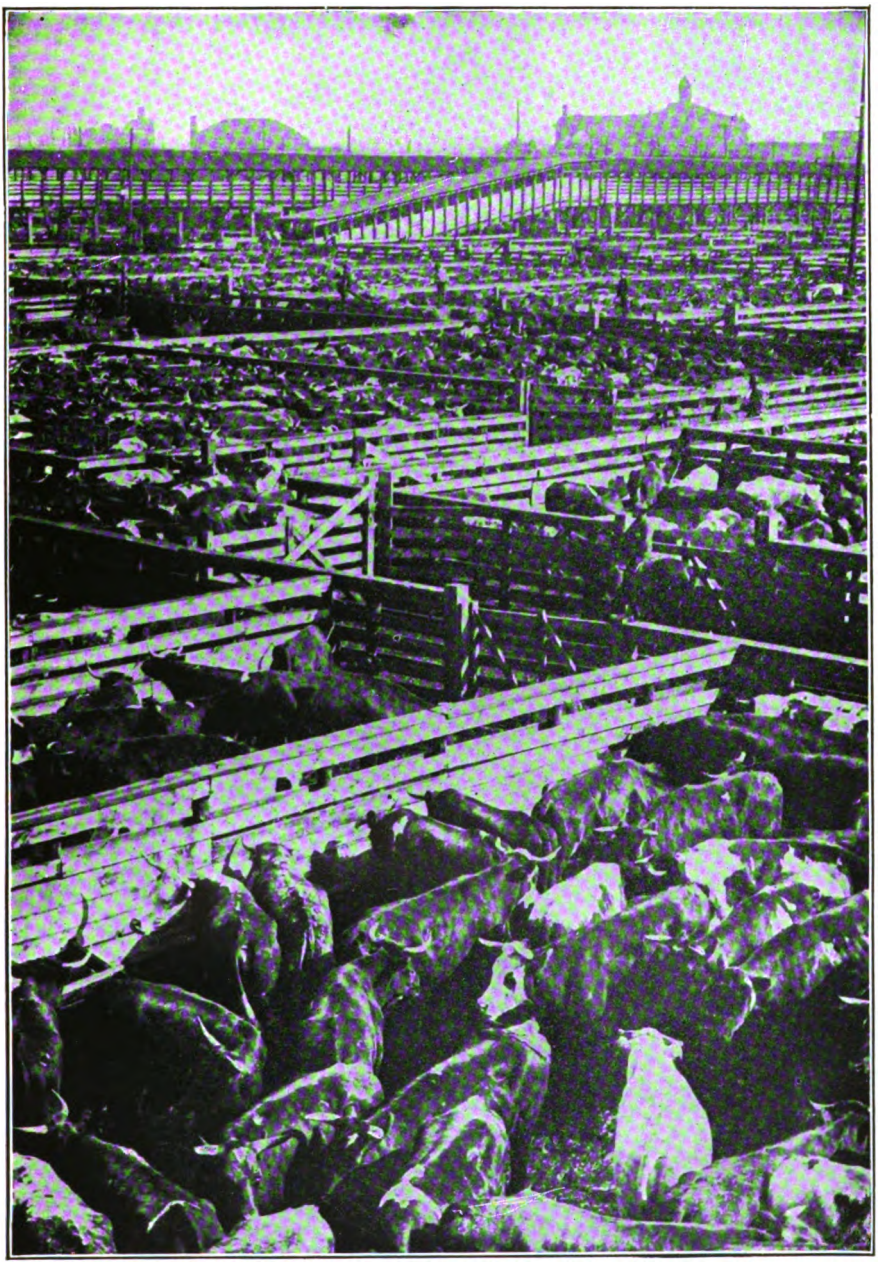
Before 1831 Chicago was a mere hamlet surrounding Fort Dearborn (built in 1803). Its charter is dated March 4, 1837, its population being then 4170, but since then it has advanced at an altogether extraordinary rate. On October 9, 1871, a great fire occurred which burned down a vast number of houses and rendered about 150,000 persons homeless and destitute, the total money loss being estimated at $190,000,000. But the energy of its inhabitants and its favorable situation enabled it to recover in a surprisingly short time. The World's Columbian Exposition, held in Chicago in 1892–1893, celebrating Columbus' discovery of America, occupied a site of 633 acres on Lake Michigan, part of which is now Jackson Park. In 1880 the population was 503,185; by the end of 1887 it had increased to nearly 800,000. In the census of 1890 it was 1,099,850; in 1900, 1,698,575; and in 1910, 2,185,283.

**Chicago Heights,** a city of Cook Co., Illinois, 26 miles S. of Chicago. It has important manufacturing industries. Pop. 18,400.

**Chicago,** UNIVERSITY OF. An institution under this title was chartered in Chicago in 1857, but met with financial difficulties, under which it succumbed in 1886. In 1888 a second effort was made to provide that city with a university, this leading to a subscription of $1,000,000. A site was chosen between Washington and Jackson Parks and the university was incorporated in 1890, Professor William Harper being chosen for its president. Mr. John D. Rockefeller, who had aided in the first subscription, afterwards added largely to his gifts, which, positive and conditional, aggregated by 1910 nearly $25,000,000. The institution is now in a flourishing condition, being one of the best endowed in the country, its productive funds amounting to about $16,000,000. It had in 1912, 354 professors and instructors and nearly 6500 students, with a library of about 350,000 volumes. One of its important adjuncts is the Yerkes Observatory, at Williams Bay, Wisconsin, the telescope of which has the largest object glass in the world.

**Chich'ester,** an episcopal and municipal city, and until 1885 a parliamentary borough of England, near the southwest corner of the country of Sussex, well built, with wide streets. Its old wall, still in good preservation and lined with lofty elms, gives it a very picturesque appearance. Its principal edifice is the cathedral, an ancient Gothic structure with a most graceful spire. Chichester takes its name (Cissaceaster) from the South Saxon king Cissa, who rebuilt it. Pop. 12,594.

**Chickadee** (chik'a-dē), the popular name in America of the black-cap titmouse (*Parus atricapillus*)



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**THE UNION STOCK YARDS, CHICAGO**

**Cattle** for all the great packing companies located in Chicago come to these yards, which hold many thousand head.

and other allied species, being derived from their note.

**Chickahom'iny,** a river in Virginia, rising about 20 miles N. W. of Richmond, flowing S. E. till it joins the James River. Near this river important battles took place during the Civil war.

**Chickamauga** (chik-a-mą'ga), a small tributary of the Tennessee River, State of Tennessee, where a battle took place September 19-20, 1863, between the Federal troops under Rosecrans and the Confederates under Bragg and Longstreet, the latter gaining an important victory.

**Chickasaw Indians** (chik'a-są), a tribe of American Indians of the Appalachian nation. In 1833 they gave up to the United States the last of their lands south of the Tennessee River, receiving as compensation a money indemnity and new lands on the left bank of the Red River, in the Indian Territory. The Chickasaws number about 8000. They made considerable advances towards civilization, had a senate, house of representatives, and a large sum of money on deposit with the Union government.